PATENT ROOM

Vol. 1127 Number 3

OFFICIAL GAZETTE

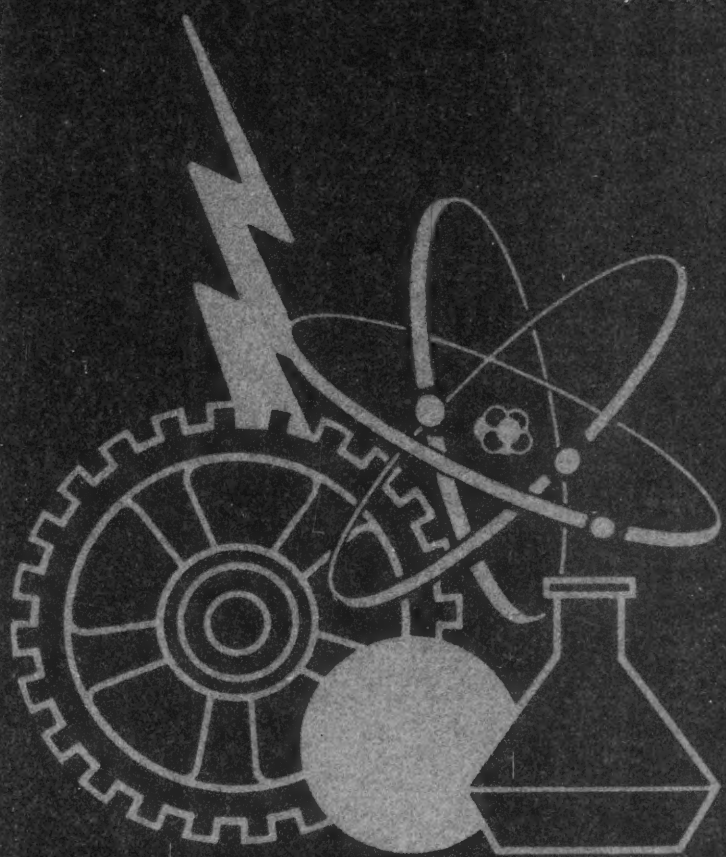
of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

June 18, 1991



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OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE

June 18, 1991 Volume 1127 Number 3

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1126 O.G. 2 on May 7, 1991.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed due to a difference in the amount of the fee in German marks and the exchange rate of the U.S. dollar in relation to the German mark as of Jan. 3, 1991, and was announced in the *Official Gazette* at 1122 O.G. 564 on Jan. 1, 1991.

International fees were changed on March 1, 1991 due to a difference in the exchange rate of the U.S. dollar in relation to the Swiss franc and were announced in the *Official Gazette* at 1122 O.G. 629 on Jan. 22, 1991.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	550.00
—Corresponding prior U.S. national application filed	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as ISA	1492.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA	400.00
—Additional examination fee, per additional invention	130.00
—ISA not the USPTO	600.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee	559.00
Basic Supplemental fee (for each page over 30)	11.00
Designation fee per country or region for the first 10 national or regional offices	135.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	171.00

U.S. National Stage fees

	Small Entity	Regular
USPTO was IPEA	165.00	330.00
USPTO was ISA but not IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	30.00	30.00

April 11, 1991

HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on June 14, 1988 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,750,218 through 4,751,745
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on June 12, 1984 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,453,271 through 4,454,610
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), and (f), as amended Nov. 5, 1990, which are reproduced below:

37 CFR § 1.20 Post-issuance fees and surcharges

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$415.00
By other than a small entity.....$830.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$835.00
By other than a small enttity.....$1670.00"

The amounts of the surcharges for paying the maintenance fee during the grace period or after the expiration of the patent are set forth in 37 CFR 1.20(k), (l) and (m), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982.....$120.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED APRIL 7, 1991
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,378,606	06/309,986	4/05/83
4,378,613	06/313,384	4/05/83
4,378,624	06/234,479	4/05/83
4,378,632	06/219,994	4/05/83
4,378,641	06/231,967	4/05/83
4,378,650	06/273,477	4/05/83
4,378,668	06/264,678	4/05/83
4,378,671	06/356,384	4/05/83
4,378,674	06/247,706	4/05/83
4,378,681	06/299,715	4/05/83
4,378,685	06/228,697	4/05/83
4,378,687	06/227,368	4/05/83
4,378,724	06/284,621	4/05/83
4,378,743	06/305,672	4/05/83
4,378,751	06/306,710	4/05/83
4,378,757	06/267,728	4/05/83
4,378,759	06/279,679	4/05/83
4,378,772	06/278,298	4/05/83
4,378,781	06/255,162	4/05/83
4,378,782	06/259,420	4/05/83
4,378,785	06/267,946	4/05/83
4,378,786	06/232,910	4/05/83
4,378,789	06/284,524	4/05/83
4,378,790	06/262,565	4/05/83
4,378,795	06/253,627	4/05/83
4,378,805	06/336,552	4/05/83
4,378,827	06/268,017	4/05/83
4,378,829	06/267,711	4/05/83
4,378,830	06/268,018	4/05/83
4,378,834	06/278,497	4/05/83
4,378,839	06/249,189	4/05/83
4,378,846	06/216,425	4/05/83
4,378,856	06/237,627	4/05/83
4,378,857	06/225,664	4/05/83
4,378,866	06/241,341	4/05/83
4,378,874	06/247,168	4/05/83
4,378,876	06/291,085	4/05/83
4,378,877	06/253,250	4/05/83
4,378,889	06/247,853	4/05/83
4,378,903	06/305,493	4/05/83
4,378,912	06/320,257	4/05/83
4,378,922	06/252,102	4/05/83
4,378,924	06/271,523	4/05/83
4,378,936	06/264,098	4/05/83
4,378,941	06/240,758	4/05/83
4,378,946	06/227,155	4/05/83
4,378,950	06/217,969	4/05/83
4,378,969	06/260,273	4/05/83
4,378,973	06/337,563	4/05/83
4,379,000	06/225,604	4/05/83
4,379,010	06/316,623	4/05/83
4,379,012	06/226,587	4/05/83
4,379,016	06/254,015	4/05/83
4,379,020	06/311,850	4/05/83
4,379,023	06/353,908	4/05/83
4,379,026	06/341,108	4/05/83
4,379,027	06/334,346	4/05/83
4,379,029	06/301,071	4/05/83
4,379,033	06/241,536	4/05/83
4,379,041	06/250,019	4/05/83
4,379,045	06/261,075	4/05/83
4,379,049	06/281,430	4/05/83
4,379,072	06/309,653	4/05/83
4,379,086	06/383,050	4/05/83
4,379,095	06/349,184	4/05/83
4,379,097	06/249,892	4/05/83
4,379,101	06/313,106	4/05/83
4,379,104	06/243,872	4/05/83
4,379,107	06/283,281	4/05/83
4,379,112	06/253,999	4/05/83
4,379,132	06/405,223	4/05/83
4,379,145	06/216,709	4/05/83
4,379,146	06/318,221	4/05/83
4,379,147	06/344,280	4/05/83
4,379,150	06/331,897	4/05/83
4,379,162	06/232,766	4/05/83
4,379,173	06/251,096	4/05/83
4,379,174	06/278,197	4/05/83
4,379,184	06/299,880	4/05/83
4,379,212	06/237,692	4/05/83
4,379,217	06/231,734	4/05/83
4,379,223	06/337,525	4/05/83
4,379,227	06/255,096	4/05/83
4,379,237	06/303,066	4/05/83

Patent Number	Serial Number	Issue Date
4,379,239	06/391,351	4/05/83
4,379,253	06/229,084	4/05/83
4,379,270	06/238,154	4/05/83
4,379,275	06/281,936	4/05/83
4,379,303	06/287,874	4/05/83
4,379,316	06/272,493	4/05/83
4,379,323	06/221,073	4/05/83
4,379,345	06/281,424	4/05/83
4,654,897	06/803,071	4/07/87
4,654,898	06/786,507	4/07/87
4,654,900	06/800,397	4/07/87
4,654,902	06/847,756	4/07/87
4,654,903	06/797,701	4/07/87
4,654,904	06/783,046	4/07/87
4,654,907	06/822,251	4/07/87
4,654,909	06/811,764	4/07/87
4,654,915	06/753,683	4/07/87
4,654,922	06/738,275	4/07/87
4,654,923	06/804,925	4/07/87
4,654,926	06/721,061	4/07/87
4,654,927	06/678,346	4/07/87
4,654,929	06/898,975	4/07/87
4,654,931	06/758,218	4/07/87
4,654,936	06/867,077	4/07/87
4,654,945	06/791,925	4/07/87
4,654,946	06/865,104	4/07/87
4,654,957	06/623,678	4/07/87
4,654,968	06/807,398	4/07/87
4,654,972	06/762,730	4/07/87
4,654,973	06/789,517	4/07/87
4,654,974	06/811,007	4/07/87
4,654,975	06/869,280	4/07/87
4,654,977	06/799,406	4/07/87
4,654,979	06/826,556	4/07/87
4,654,981	06/702,554	4/07/87
4,654,985	06/686,148	4/07/87
4,654,991	06/734,111	4/07/87
4,654,992	06/779,098	4/07/87
4,654,994	06/827,646	4/07/87
4,655,000	06/727,051	4/07/87
4,655,002	06/887,744	4/07/87
4,655,003	06/852,839	4/07/87
4,655,004	06/769,643	4/07/87
4,655,006	06/692,235	4/07/87
4,655,008	06/811,071	4/07/87
4,655,011	06/649,624	4/07/87
4,655,016	06/776,657	4/07/87
4,655,024	06/553,014	4/07/87
4,655,030	06/830,634	4/07/87
4,655,032	06/714,522	4/07/87
4,655,040	06/712,960	4/07/87
4,655,042	06/916,961	4/07/87
4,655,052	06/832,339	4/07/87
4,655,058	06/477,632	4/07/87
4,655,080	06/782,992	4/07/87
4,655,086	06/728,890	4/07/87
4,655,087	06/767,099	4/07/87
4,655,090	06/859,482	4/07/87
4,655,094	06/647,750	4/07/87
4,655,097	06/790,063	4/07/87
4,655,099	06/705,748	4/07/87
4,655,106	06/784,788	4/07/87
4,655,108	06/776,353	4/07/87
4,655,109	06/363,024	4/07/87
4,655,110	06/824,966	4/07/87
4,655,113	06/345,798	4/07/87
4,655,119	06/286,101	4/07/87
4,655,120	06/812,848	4/07/87
4,655,123	06/792,052	4/07/87
4,655,124	06/752,959	4/07/87
4,655,126	06/730,673	4/07/87
4,655,146	06/636,680	4/07/87
4,655,147	06/826,045	4/07/87
4,655,149	06/858,415	4/07/87
4,655,158	06/703,035	4/07/87
4,655,162	06/707,449	4/07/87
4,655,170	06/803,241	4/07/87
4,655,171	06/800,804	4/07/87
4,655,185	06/762,508	4/07/87
4,655,198	06/733,763	4/07/87
4,655,204	06/612,900	4/07/87
4,655,205	06/732,359	4/07/87
4,655,206	06/585,848	4/07/87
4,655,212	06/720,454	4/07/87
4,655,215	06/712,271	4/07/87
4,655,236	06/751,059	4/07/87
4,655,240	06/716,846	4/07/87
4,655,243	06/801,302	4/07/87
4,655,252	06/229,637	4/07/87
4,655,260	06/849,686	4/07/87
4,655,262	06/806,262	4/07/87
4,655,270	06/709,526	4/07/87
4,655,272	06/634,698	4/07/87
4,655,273	06/762,554	4/07/87
4,655,277	06/605,024	4/07/87
4,655,282	06/645,807	4/07/87
4,655,296	06/765,946	4/07/87
4,655,297	06/691,629	4/07/87
4,655,308	06/777,944	4/07/87
4,655,313	06/769,486	4/07/87
4,655,322	06/860,420	4/07/87
4,655,333	06/733,388	4/07/87
4,655,339	06/685,925	4/07/87
4,655,346	06/766,484	4/07/87
4,655,351	06/848,777	4/07/87
4,655,369	06/586,210	4/07/87
4,655,371	06/822,262	4/07/87
4,655,377	06/761,034	4/07/87
4,655,379	06/729,600	4/07/87
4,655,389	06/635,443	4/07/87
4,655,399	06/713,791	4/07/87
4,655,402	06/334,305	4/07/87
4,655,409	06/719,222	4/07/87
4,655,410	06/812,591	4/07/87
4,655,423	06/740,154	4/07/87
4,655,426	06/755,323	4/07/87
4,655,428	06/817,042	4/07/87
4,655,442	06/713,436	4/07/87
4,655,444	06/848,966	4/07/87
4,655,448	06/740,729	4/07/78
4,655,451	06/579,579	4/07/87
4,655,452	06/695,296	4/07/87
4,655,455	06/741,212	4/07/87
4,655,456	06/457,697	4/07/87
4,655,458	06/811,832	4/07/87
4,655,469	06/812,806	4/07/87
4,655,479	06/787,580	4/07/87
4,655,480	06/762,953	4/07/87
4,655,483	06/609,919	4/07/87
4,655,488	06/782,946	4/07/87
4,655,497	06/676,865	4/07/87
4,655,506	06/698,010	4/07/87
4,655,510	06/838,646	4/07/87
4,655,511	06/695,141	4/07/87
4,655,512	06/788,320	4/07/87
4,655,514	06/841,085	4/07/87
4,655,530	06/819,367	4/07/87
4,655,533	06/343,973	4/07/87
4,655,539	06/664,392	4/07/87
4,655,549	06/704,401	4/07/87
4,655,555	06/675,735	4/07/87
4,655,559	06/792,111	4/07/87
4,655,563	06/801,440	4/07/87
4,655,567	06/837,188	4/07/87
4,655,569	06/804,504	4/07/87
4,655,587	06/781,185	4/07/87
4,655,592	06/567,407	4/07/87
4,655,605	06/708,244	4/07/87
4,655,619	06/277,477	4/07/87
4,655,632	06/838,259	4/07/87
4,655,636	06/733,777	4/07/87
4,655,641	06/789,237	4/07/87
4,655,644	06/617,884	4/07/87
4,655,654	06/809,772	4/07/87
4,655,663	06/672,354	4/07/87
4,655,669	06/747,274	4/07/87

Patent Number	Serial Number	Issue Date
4,655,688	06/739,553	4/07/87
4,655,704	06/840,014	4/07/87
4,655,705	06/834,803	4/07/87
4,655,714	06/720,149	4/07/87
4,655,720	06/752,285	4/07/87
4,655,726	06/782,808	4/07/87
4,655,727	06/787,546	4/07/87
4,655,747	06/824,125	4/07/87
4,655,749	06/781,746	4/07/87
4,655,765	06/616,338	4/07/87
4,655,772	06/738,222	4/07/87
4,655,776	06/570,089	4/07/87
4,655,784	06/738,168	4/07/87
4,655,793	06/735,552	4/07/87
4,655,812	06/776,630	4/07/87
4,655,851	06/743,449	4/07/87
4,655,860	06/484,105	4/07/87
4,655,883	06/614,874	4/07/87
4,655,884	06/767,384	4/07/87
4,655,885	06/817,570	4/07/87
4,655,891	06/643,151	4/07/87
4,655,893	06/531,119	4/07/87
4,655,895	06/719,288	4/07/87
4,655,908	06/774,739	4/07/87
4,655,914	06/674,768	4/07/87
4,655,928	06/543,191	4/07/87
4,655,938	06/705,994	4/07/87
4,655,942	06/697,550	4/07/87
4,655,945	06/823,254	4/07/87
4,655,961	06/688,227	4/07/87
4,655,968	06/670,373	4/07/87
4,655,976	06/258,172	4/07/87
4,655,978	06/592,869	4/07/87
4,655,983	06/764,574	4/07/87
4,655,985	06/644,461	4/07/87
4,655,996	06/539,393	4/07/87
4,655,997	06/555,012	4/07/87
4,655,998	06/555,011	4/07/87
4,656,001	06/719,645	4/07/87
4,656,006	06/809,835	4/07/87
4,656,007	06/779,578	4/07/87
4,656,008	06/658,118	4/07/87
4,656,012	06/741,214	4/07/87
4,656,023	06/744,681	4/07/87
4,656,025	06/725,246	4/07/87
4,656,033	06/741,600	4/07/87
4,656,038	06/700,406	4/07/87
4,656,039	06/754,363	4/07/87
4,656,041	06/769,738	4/07/87
4,656,046	06/769,781	4/07/87
4,656,055	06/854,692	4/07/87
4,656,060	06/744,900	4/07/87
4,656,061	06/716,276	4/07/87
4,656,063	06/874,449	4/07/87
4,656,065	06/820,412	4/07/87
4,656,088	06/768,608	4/07/87
4,656,100	06/723,759	4/07/87
4,656,102	06/805,281	4/07/87
4,656,104	06/814,163	4/07/87
4,656,106	06/787,353	4/07/87
4,656,115	06/800,108	4/07/87
4,656,118	06/771,192	4/07/87
4,656,119	06/802,450	4/07/87
4,656,127	06/602,720	4/07/87
4,656,136	06/591,532	4/07/87
4,656,143	06/611,351	4/07/87
4,656,148	06/768,417	4/07/87
4,656,160	06/799,110	4/07/87
4,656,166	06/612,896	4/07/87
4,656,171	06/675,299	4/07/87
4,656,175	06/754,343	4/07/87
4,656,178	06/726,283	4/07/87
4,656,180	06/708,239	4/07/87
4,656,210	06/732,102	4/07/87
4,656,235	06/772,785	4/07/87
4,656,236	06/823,371	4/07/87
4,656,243	06/737,603	4/07/87
4,656,248	06/726,433	4/07/87
4,656,251	06/695,576	4/07/87
4,656,259	06/769,760	4/07/87
4,656,271	06/831,753	4/07/87
4,656,278	06/733,928	4/07/87
4,656,289	06/664,505	4/07/87
4,656,295	06/742,033	4/07/87
4,656,316	06/790,554	4/07/87
4,656,323	06/733,709	4/07/87
4,656,324	06/839,491	4/07/87
4,656,337	06/791,411	4/07/87
4,656,343	06/761,150	4/07/87
4,656,352	06/771,738	4/07/87
4,656,358	06/711,122	4/07/87
4,656,371	06/793,606	4/07/87
4,656,398	06/803,302	4/07/87
4,656,405	06/795,937	4/07/87
4,656,406	06/778,523	4/07/87
4,656,408	06/673,957	4/07/87
4,656,410	06/764,725	4/07/87
4,656,421	06/777,175	4/07/87
4,656,425	06/598,237	4/07/87
4,656,439	06/531,319	4/07/87
4,656,448	06/677,980	4/07/87
4,656,463	06/487,284	4/07/87
4,656,481	06/637,141	4/07/87
4,656,514	06/767,646	4/07/87
4,656,538	06/797,932	4/07/87
4,656,543	06/757,167	4/07/87
4,656,549	06/681,242	4/07/87
4,656,554	06/713,495	4/07/87
4,656,559	06/608,952	4/07/87
4,656,564	06/841,569	4/07/87
4,656,569	06/790,129	4/07/87
4,656,577	06/717,337	4/07/87
4,656,626	06/682,033	4/07/87
4,656,651	06/774,113	4/07/87
4,656,657	06/787,690	4/07/87

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b).

4,567,448, Re. S. N. 07/693,050, Filed Apr. 30, 1991, Cl. 331, VARIABLE FREQUENCY OSCILLATOR, Masayuki Ikeda, Owner of Record: *Epson Corp., Tokyo, Japan,* Attorney or Agent: Harold I. Kaplan, Ex. Gp.: 252

4,806,961, Re. S. N. 07/658,696, Filed Feb. 21, 1991, Cl. 354/195.1, PHOTOGRAPHIC CAMERA, Masatoshi Kamitani, et al., Owner of Record: *Minolta Camera Kabushiki Kaisha, Osaka, Japan,* Attorney or Agent: Matthew L. Schneider, Ex. Gp.: 211

4,809,230, Re. S. N. 07/662,663, Filed Feb. 28, 1991, Cl. 365/189, SEMICONDUCTOR MEMORY DEVICE WITH ACTIVE PULL UP, Yasuhiro Konishi, et al., Owner of Record: *Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan,* Attorney or Agent: Israel Gopstein, Ex. Gp.: 233

4,821,886, Re. S. N. 07/665,483, Filed March 6, 1991, Cl. 209/618, CLEANING DEVICE FOR AGRICULTURAL PRODUCTS, Herman P. Roethig, Owner of Record: *Inventor,* Attorney or Agent: Ross F. Hunt, Ex. Gp.: 312

4,827,757, Re. S. N. 07/696,936, Filed May 8, 1991, Cl. 72/420, ROBOTIZED HANDLING DEVICE AND SHEET METAL BENDING SYSTEM FEATURING SAME, Franco Sartorio, Owner of Record: *Amanda Co., Ltd., Ishida, Japan,* Attorney or Agent: Michael D. Wright, Ex. Gp.: 321

4,852,365, Re. S. N. 07/694,224, Filed Apr. 3, 1991, Cl. 62/225, REFRIGERATION SYSTEM, Granville P. Elrod, et al., Owner of Record: *Standex International Corp., Salem, N. H.*, Attorney or Agent: Lawrence A. Maxham, Ex. Gp.: 344

4,924,691, Re. S. N. 07/695,457, Filed May 3, 1991, Cl. 72/391, BREAKSTEM FASTENER INSTALLATION TOOL, Fredrick Arthur Summerlin, et al., Owner of Record: *Avdel Systems Ltd., Hertfordshire, England*, Attorney or Agent: Gregory J. Maier, Ex. Gp.: 321

4,927,556, Re. S. N. 07/694,448, Filed May 1, 1991, Cl. 252/173, AQUEOUS BASED COMPOSITION CONTAINING DIBASIC ESTER AND THICKENING AGENT FOR REMOVING COATINGS, Richard J. Pokorny, Owner of Record: *Minnesota Mining and Manufacturing Co., St. Paul, Minn.*, Attorney or Agent: Carolyn A. Bates, Ex. Gp.: 115

4,949,650, Re. S. N. 07/699,172, Filed May 13, 1991, Cl. 108/146, TABLE HAVING A PART OF WHICH IS ADJUSTABLE UPWARDLY, David D. Allard, Owner of Record: *Inventor*, Attorney or Agent: Joseph J. Kelly, Ex. Gp.: 357

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

4,557,774, Reexam. No. 90/002,341, Requested May 7, 1991, Cl. 156/071, SYSTEM FOR HOLDING CARPET IN PLACE WITHOUT STRETCHING, Merle R. Hoopengardner, Owner of Record: *Step Loc Corp., Lafayette, Calif.*, Attorney or Agent: Donald C. Feix, San Mateo, Calif., Ex. Gp.: 131, Requester: E. R. Carpenter Co., Richmond, Va.

4,622,977, Reexam. No. 90/002,337, Requested Apr. 30, 1991, Cl. 128/663, ULTRASONIC DIAGNOSTIC APPARATUS, Koroku Namekawa, et al., Owner of Record: *Aloka Co., Ltd., Tokyo, Japan*, Attorney or Agent: William L. Androlia, Koda & Androlia, Los Angeles, Calif., Ex. Gp.: 335, Requester: Owner

4,701,486, Reexam. No. 90/002,342, Requested May 8, 1991, Cl. 524/182, STABILIZER COMOSITIONS FOR PVC RESINS, Robert E. Bresser, et al., Owner of Record: *Morton Thiokol, Chicago, Ill.*, Attorney or Agent: Gerald K. White, Chicago, Ill., Ex. Gp.: 159, Requester: Owner

4,867,760, Reexam. No. 90/002,344, Requested May 13, 1991, Cl. 051/298, COATED ABRASIVE, Walter A. Yarbrough, Owner of Record: *Norton Co., Worcester, Mass.*, Attorney or Agent: David Bennett, Worcester, Mass., Ex. Gp.: 118, Requester: Owner

4,899,563, Reexam. No. 90/002,340, Requested May 6, 1991, Cl. 070/367, RE-KEYABLE PIN TUMBLER DRAWER LOCK AND PIN TUMBLER CABINET DOOR LOCK, Frank J. Martin, Owner of Record: *Frank J. Martin Co., Seattle, Wash.*, Attorney or Agent: Michael J. Folise, Stratton, Dwyer, Bellomy, et al., Seattle, Wash., Ex. Gp.: 358, Requester: Owner

4,916,726, Reexam. No. 90/002,329, Requested Apr. 25, 1991, Cl. 379/088, TELEPHONE ANSWERING SERVICE WITH INTEGRATED VOICE AND TEXTUAL MESSAGE STORAGE, John F. Morley, et al., Owner of Record: *American Tel-A-System, Inc., McFarland, Wisc.*, Attorney or Agent: Donald E. Stout, Antonelli, Terry, Stout & Kraus, Washington, D.C., Ex. Gp.: 261, Requester: Owner

4,917,465, Reexam. No. 90/002,339, Requested May 1, 1991, Cl. 350/335, COLOR DISPLAY SYSTEM, Arlie R. Conner, et al., Owner of Record: *In Focus Systems, Inc., Tualatin, Oreg.*, Attorney or Agent: Robert J. Bennett, Dirks B. Fosters, San Fransisco, Calif., Ex. Gp.: 254, Requester: Computer Accessories Corp., San Diego, Calif.

5,012,350, Reexam. No. 90/002,343, Requested May 9, 1991, Cl. 358/335.0, TELEVISION LOCAL WIRELESS TRANSMISSION AND CONTROL, Donald A. Streck, et al., Owner of Record: *Donald A. Streck, Ventura, Calif. & Jerry R. Iggulden, Newhall, Calif.*, Attorney or Agent: Donald A. Streck, Ventura, Calif., Ex. Gp.: 235, Requester: Gemini Industries, Inc., Clifton, N. J.

Error in *Code of Federal Regulations* (C. F. R.) Rule 1.8, 37 C. F. R. 1.8

The following C. F. R. Correction appeared in the *Federal Register*, at 56 FR 14648, on April 11, 1991:

In the July 1, 1990 revision of title 37 of the Code of Federal Regulations, on page 14, column two, § 1.8, paragraphs (a)(2)(xiv), (xv), and (xvi) were inadvertently placed after paragraph (b). These paragraphs should be correctly placed after paragraph (a)(2)(xiii) and before paragraph (b), in column one.

Rule 1.8 (37 C. F. R. § 1.8), which is entitled "Certificate of Mailing," sets out the conditions for the timely filing by first-class mail of papers utilizing the Certificate of Mailing procedure. Under Rule 1.8(a)(2), certain papers are excluded from the Certificate of Mailing procedure and will not be considered timely filed if received after the due date, unless deposited as Express Mail in compliance with Rule 1.10 (37 C. F. R. § 1.10). There are sixteen (16) exclusions, numbered 1.8(a)(2)(i) through (xvi). However, the list of exclusions, as printed in the July 1, 1990 revision of the C. F. R., is interrupted at 1.8(a)(2) (xiii) by paragraph 1.8(b), before it resumes with 1.8(a)(2)(xiv) through (xvi). Therefore, at first glance, it appears that there are only thirteen (13) exclusions. The exclusions for statements of use under Rule 2.88; extension requests under Rule 2.89 for filing a statement of use; and amendments to allege use in commerce under Rule 2.76 were inadvertently placed after paragraph (b).

Any appicant who relied to its detriment on the July 1, 1990 revision of the C. F. R. and utilized a Rule 1.8 Certificate of Mailing when filing either a statement of use or an extension request for filing a statement of use, resulting in abandonment of the application, may petition the Commissioner to revive its application. Further, any applicant who filed an amendment to allege use and relied to its detriment on the July 1, 1990 revision to the C. F. R., resulting in its amendment to allege use being considered untimely, may also petition the Commissioner for relief.

Pursuant to Rules 2.66 and 2.146(c), applicant must support its statement of detrimental reliance with an affidavit or declaration in accordance with Rule 2.20, averring that on a specific date between July 1, 1990 and the date of publication of this notice in the *Official Gazette*, petitioner filed one of the three relevant documents pursuant to Rule 1.8; relied on the 1990 revision of the C. F. R.; and believed that the relevant document was not excluded from filing under Rule 1.8 the petition fee is $100 per application. Rule 2.6(k).

May 15, 1991

JEFFREY M. SAMUELS
Assistant Commissioner for Trademarks

Errata

The following registration numbers were inadvertantly listed as cancelled in the "Trademark Registration Cancelled, Section 8" and "Index of Registrants" sections of the Official Gazette:

TM 232 & TMI 17	1,254,520	Nov. 6, 1990
TM 205 & TMI 24	1,265,575	June 26, 1990
TM 191 & TMI 24	1,221,342	May 1, 1990

TM 199 & TMI 12	1,235,576	June 26, 1990
TM 191 & TMI 10	1,224,988	May 1, 1990
TM 171 & TMI 37	1,249,078	Jan. 9, 1990
TM 185 & TMI 37	1,259,545	May 22, 1990
TM 199 & TMI 7	1,342,162	June 26, 1990
TM 192 & TMI 27	1,257,470	May 1, 1990
TM 289 & TMI 25	1,252,832	Mar. 27, 1990
TM 191 & TMI 19	1,325,398	Mar. 12, 1990
TM 295 & TMI 7	1,400,783	Aug. 21, 1990
TM 229 & TMI 17	1,420,035	Feb. 12, 1991
TM 227 & TMI 1	1,379,200	Feb. 26, 1991
TM 206 & TMI 10	1,299,893	Jan. 15, 1991
TM 229 & TMI 20	1,235,257	July 24, 1990
TM 157 & TMI 30	1,265,259	July 3, 1990
TM 277 & TMI 9	1,251,839	Sept. 25, 1990
TM 271 & TMI 20	1,264,537	July 31, 1990
TM 237 & TMI 24	1,263,471	Oct. 2, 1990
TM 203 & TMI 24	1,286,960	Nov. 27, 1990
TM 264 & TMI 27	1,271,267	Sept. 11, 1990
TM 295 & TMI 13	1,274,315	Aug. 21, 1990
TM 216 & TMI 10	1,306,615	Apr. 10, 1990

Consequently, the above-identified registrations are still active.

May 17, 1991

PATRICIA M. DAVIS
Administrator of Trademark Operations

The following registration numbers were inadvertently listed as cancelled in the "Trademark Registraions Cancelled, Section 7d" and "Index of Registrants" sections of the Official Gazette:

TM 181 & TMI 29	1,302,099	Apr. 9, 1991
TM 168 & TMI 18	1,281,199	Jan. 1, 1991
TM 190 & TMI 4	230,702	Mar. 19, 1991
TM 190 & TMI 5	745,163	Mar. 19, 1991
TM 190 & TMI 4	745,150	Mar. 19, 1991
TM 190 & TMI 5	814,059	Mar. 19, 1991
TM 190 & TMI 18	1,313,148	Mar. 19, 1991
TM 198 & TMI 8	1,336,779	Mar. 19, 1991
TM 198 & TMI 11	1,347,777	Mar. 19, 1991
TM 198 & TMI 8	1,348,043	Mar. 19, 1991
TM 198 & TMI 16	1,349,835	Mar. 19, 1991
TM 198 & TMI 16	1,350,491	Mar. 19, 1991
TM 198 & TMI 16	1,360,926	Mar. 19, 1991
TM 198 & TMI 16	1,367,096	Mar. 19, 1991
TM 198 & TMI 16	1,421,280	Mar. 19, 1991
TM 198 & TMI 16	1,528,490	Mar. 19, 1990
TM 198 & TMI 16	1,534,625	Mar. 19, 1991
TM 198 & TMI 16	1,567,698	Mar. 19, 1991
TM 198 & TMI 16	1,576,964	Mar. 19, 1991
TM 198 & TMI 16	1,586,743	Mar. 19, 1991
TM 198 & TMI 16	1,598,574	Mar. 19, 1991
TM 198 & TMI 16	1,606,955	Mar. 19, 1991
TM 198 & TMI 16	1,607,462	Mar. 19, 1991
TM 198 & TMI 16	1,611,851	Mar. 19, 1991
TM 198 & TMI 16	1,582,206	Mar. 19, 1991

Consequently, the above-identified registrations are still active.

May 17, 1991

PATRICIA M. DAVIS
Administrator of Trademark Operations

"All reference to Patent No. 5,000,986 to Chou H. Li of Roslyn, N. Y. for `METALLIZED COATINGS ON CERAMICS FOR HIGH-TEMPERATURE USES' appearing in the Official Gazette of March 19, 1991 should be deleted since no patent was granted."

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceeding sent by certified mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, their assigns or legal representatives shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Diva, Inc., Eatontown, N.J., Reg. No. 1,025,655, for the mark "DIVA" and design, Canc. No. 19,221.

Stahl-Urban Company, Brookhaven, Miss., Reg. No. 670,634, for the mark "WEEKENDERS" (stylized), Canc. No. 19,371.

Photo Promotion Associates, Inc., Monsey, N. Y., Reg. No. 1,003,742, for the mark "INSTA-PLAK", Canc. No. 19,425.

Contour Hosiery, Inc., Kenosha, Wisc., Reg. No. 357,615, for the mark "CONTOUR" (stylized), Canc. No. 19,444.

I Need A Vacation Inc., El Paso, Tex., Reg. No. 1,492,626, for the mark "I NEED A VACATION INC." and design, Canc. No. 19,463.

Michael Anderson, Los Angeles, Calif., Reg. No. 1,439,165, for the mark "TAXI" and design, Canc. No. 19,496.

Schaak Electronics, Inc., St. Paul, Minn., Reg. No. 1,002,669, for the mark "DLK" and design, Canc. No. 19,510.

United States Football League, New York, N. Y., Reg. No. 1,352,906, for the mark "L. A. EXPRESS" and design, Canc. No. 19,513.

Howland Chemical Products, Inc., Newark, N. J., Reg. No. 1,395,456, for the mark "ALPINE", Canc. No. 19,417.

Marquee Productions, Inc., Cincinnati, Ohio, Reg. No. 1,544,908, for the mark "DISCOVERY GIRL U. S. A." and design, Canc. No. 19,439.

JEAN BROWN
Administrator of the
Trademark Trial and
Appeal Board
For JEFFREY M. SAMUELS
Assistant Commissioner
for Trademarks

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceeding sent by registered mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

West Bay Design Inc., Burlingame, Calif., Reg. No. 1,232,862, for the mark "RIVA", Canc. No. 19,525.

JEAN BROWN
Administrator, Trademark
Trial and Appeal Board
For JEFFREY M. SAMUELS
Assistant Commissioner for Trademarks

PATENT NOTICES

Certificates of Correction For Week of June 18, 1991

B1. Re. 32,521	4,868,489	4,893,257	4,925,689
B1. 4,381,056	4,868,748	4,893,309	4,925,910
D. 299,142	4,870,588	4,893,575	4,926,835
D. 308,986	4,870,666	4,893,908	4,928,388
D. 309,511	4,874,675	4,894,169	4,930,021
Re. 33,247	4,875,575	4,898,434	4,930,135
4,734,739	4,876,412	4,898,854	4,930,336
4,759,352	4,876,559	4,898,911	4,930,731
4,776,161	4,877,215	4,900,165	4,930,818
4,778,761	4,878,001	4,901,063	4,931,107
4,780,467	4,878,444	4,901,293	4,931,135
4,781,808	4,878,539	4,901,539	4,931,208
4,782,449	4,878,559	4,901,840	4,931,264
4,783,164	4,879,357	4,903,412	4,932,057
4,785,516	4,880,883	4,904,320	4,932,085
4,787,838	4,881,248	4,905,472	4,932,177
4,794,418	4,881,702	4,906,779	4,933,536
4,796,343	4,881,786	4,906,793	4,933,620
4,799,180	4,882,421	4,907,058	4,934,570
4,809,010	4,883,344	4,907,720	4,934,860
4,823,784	4,883,536	4,908,962	4,936,281
4,831,835	4,884,085	4,909,458	4,937,005
4,840,375	4,884,247	4,909,615	4,937,214
4,841,078	4,885,076	4,909,783	4,937,410
4,842,437	4,885,144	4,911,337	4,937,542
4,843,000	4,886,197	4,913,162	4,937,610
4,844,662	4,886,387	4,913,259	4,938,682
4,848,159	4,887,099	4,914,732	4,938,709
4,851,226	4,887,770	4,914,922	4,941,887
4,851,278	4,887,984	4,915,014	4,942,292
4,855,906	4,888,680	4,915,657	4,943,323
4,857,990	4,888,998	4,915,782	4,943,699
4,861,966	4,889,186	4,918,358	4,948,874
4,864,008	4,890,054	4,918,781	4,955,762
4,865,988	4,890,132	4,919,364	4,965,174
4,866,015	4,891,045	4,919,715	4,968,288
4,866,166	4,891,273	4,920,100	4,968,979
4,866,339	4,891,692	4,920,544	4,973,307
4,867,700	4,892,326	4,923,766	4,979,915
4,867,871	4,893,025	4,924,477	4,994,337
4,868,085	4,893,253	4,925,609	5,006,685

SPECIAL BOXES FOR MAIL

Special PTO mail box numbers should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded directly to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these boxes. If any documents other than the specified type identified for each box are addressed to that box, they will be delayed in reaching the appropriate area for which they are intended.

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Box 15	Mail for the Advisory Commission on Patent Law Reform.
Box 16	Deposit Account Replenishment Checks
Box 171	Vacancy Announcement Applications.
Box AF	Expedited procedure for processing amendments and other responses after final rejection.
Box Assignment	All assignment documents except those filed with new applications.
Box DD	Mail related to Disclosure Documents.
Box EEO	Mail for the Office of Equal Employment Programs.
Box FWC	Requests for File Wrapper Continuation Applications (under 37 CFR 1.62)
Box Interference	Communications relating to interferences and applications and patents involved in interference.
Box Issue Fee	All Communications following the receipt of a PTOL-85. "Notice of Allowance and Issue Fee Due," and prior to the issuance of a patent should be addressed to Box Issue Fee, unless advised to the contrary. Assignments should be submitted in a separate envelope and not be sent to Box Issue Fee.
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Since there are variations in the scope of patent collections among the PDLs and in their hours of service to the public, anyone contemplating use of the patents at a particular library is urged to contact that library, in advance, about its collection and hours in order to avert possible inconvenience.

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ORGANIC CHEMISTRY GROUP 120—JOHN F. TERAPANE, JR., Director	308-1235
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP— 130 BARRY S. RICHMAN, Director	308-0651
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Expiration of patents: The patents within the range of numbers indicated below expire during May 1991 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,808,604 to 3,813,693 inclusive
Plant Patents ..... 3,541 to 3,560 inclusive

REEXAMINATIONS

JUNE 18, 1991

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,648,907 (1492nd)
HIGH COLOR STRENGTH DIARYLIDE YELLOW PIGMENT COMPOSITIONS

Byron G. Hays, Verona, and Robert J. Stanaback, Gladstone, both of N.J., assignors to BASF Corporation, Clifton, N.J.

Reexamination Request No. 90/002,054, Jun. 12, 1990.
Reexamination Certificate for Patent No. 4,648,907, issued Mar. 10, 1987, Ser. No. 722,976, Apr. 12, 1985.
Int. Cl.[5] C09D *11/08*
U.S. Cl. 106—30

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–6** are cancelled.

[1. A method of manufacturing diarylide yellow pigments comprising tetrazotizing 3,3′-dichlorobenzidine, then coupling the tetrazonium salt with an acetoacetarylide, and then filtering and washing the resulting pigment, wherein the improvement comprises:

modifying the tetrazotized 3,3′-dichlorobenzidine by reacting with about 3 mole % to about 5 mole % of an acetic acid solution of a first acetoacetarylide; and

then coupling the modified 3,3′-dichlorobenzidine tetrazonium salt into a slurry of a second acetoacetarylide, thereby producing diarylide yellow pigment compositions having increased color strength over diarylide yellow compositions produced by conventional methods.]

B1 4,773,485 (1493rd)
FIRE EXTINGUISHING SYSTEM FOR COOKSTOVE AND RANGES

Robert R. Silverman, Panama City, Fla., assignor to Twenty First Century International Fire Equipment and Services, Corporation

Reexamination Request No. 90/002,108, Aug. 14, 1990.
Reexamination Certificate for Patent No. 4,773,485, issued Sep. 27, 1988, Ser. No. 27,919, Mar. 19, 1987.
Int. Cl.[5] A62C *3/04*
U.S. Cl. 169—65

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–12** is confirmed.

1. A system for extinguishing a residential stove top fire which may occur on a residential stove range that has burners and is used in conjunction with a hood, cabinet and means for energizing the burners, the system comprising in combination:

an enclosure defined by the hood, the enclosure having a top wall, first and second side walls, a front wall and a rear wall; the walls joining at first and second front corners and first and second rear corners, the cabinet being positioned over and in juxtaposition with the hood;

a pair of nozzles positioned within the hood, and facing the burners of the stove range, the nozzles being in juxtaposition with the side walls of the hood;

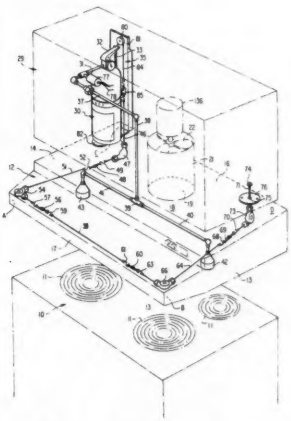
a fire extinguisher positioned in the cabinet and connected to the nozzles via a pipe which passes through the wall of the cabinet and the top of the hood and has branches to the nozzles for dispensing fire suppressant material through the nozzles;

means for operating the fire extinguisher and means for biasing the operating means to a first position which causes the fire extinguisher to discharge the fire suppressant;

means for holding the operating means in a second position in opposition to the biasing means, wherein when the operating means is in the second position, the fire extinguisher is prevented from discharging;

the means for holding the operating means in the second position including a cable means segmented in a plurality of sections, each section being connected to adjacent sections by fusible links, the cable means including means for adjusting the length of the cable means;

pulley means positioned inside of the hood, the pulley means including a first pulley adjacent the first rear corner thereof, a second pulley adjacent the front wall and juxtaposed with the first front corner thereof, a third pulley



adjacent the front wall and juxtaposed with a second front corner thereof and a fourth pulley adjacent the second rear corner thereof; the cable means being trained around the pulleys;

means for anchoring one end the cable means to the hood in a position adjacent to the fourth pulley; whereby the cable means is held in tension substantially around and in alignment with the inner periphery of the hood to hold the operating means in a second position, and whereby when there is a fire on the stove at least one of the fusible links separates, releasing tension on the cable and allowing the operator to move from the second position to the first position under a force exerted by the biasing means; and

a pressure sensor connected to the outlet of the fire extinguisher for detecting release of the fire suppressant and thus the occurrence of a fire, the pressure sensor being connected to a circuit, which circuit includes means for interrupting energy flowing from the energizing means to the burners of the stove.

REISSUES

JUNE 18, 1991

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

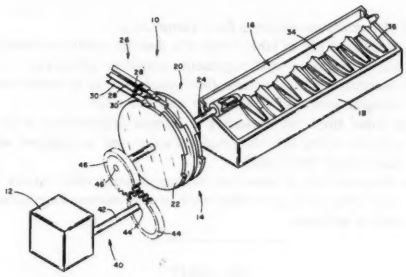
Re. 33,612
ICE MAKER SYSTEM

Ronald E. Cole, 933 Sleepy Hollow Pl., Greenwood, Ind. 46142

Original No. 4,697,432, dated Oct. 6, 1987, Ser. No. 888,875, Jul. 24, 1986. Application for reissue Oct. 19, 1988, Ser. No. 259,961

Int. Cl.[5] **F25C** *5/04*

U.S. Cl. 62—233 **4 Claims**



3. An ice making system comprising:

tray means for holding water while it is being frozen into ice;

rake means for mechanically removing said ice from said tray means; and

drive means for moving said rake from an initial position, through an ice removing range in which it removes ice from said tray means, and thereafter returning it to said initial position, said drive means including means for driving said rake means at a first non-zero speed when it is removing said ice from said tray means and at a second non-zero speed when it is being returned to said initial position, said second speed being faster than said first speed.

Re. 33,613
ROTARY APPARATUS

Ernest R. Bodnar, 2 Danrose Crescent, Toronto, Ontario M3B 3N5, Canada

Original No. 4,732,028, dated Mar. 22, 1988, Ser. No. 938,406, Dec. 5, 1986. Continuation-in-part of Ser. No. 811,442, Dec. 20, 1985, abandoned, which is a continuation-in-part of Ser. No. 598,978, Apr. 11, 1984, abandoned. Application for reissue Sep. 5, 1989, Ser. No. 402,658

Int. Cl.[5] **B21D** *37/12*

U.S. Cl. 72—190 **17 Claims**

1. A rotary [cutting and] forming apparatus for forming strip material *having a major plane and* for use in association with [material forming] *material-forming* dies [comprising], *which dies have strip material-engaging forming planes and which apparatus comprises:*

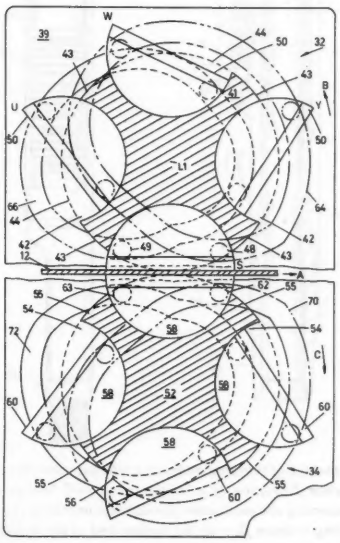
a rotatable upper roll unit and a corresponding rotatable lower roll unit, said units being connected for synchronous rotation *through rotary cycles,* each of said units comprising a [corner] *carrier* defining a central axis, said member having at least one recess extending along said member parallel to the central axis, said recess having bearing surface means of generally [semi-circular] *semi-cylindrical* shape, and [at least one] *a* die support block, rotatably received within said recess, said block defining two ends and a [platan] *platen* surface to which [at least one of] *a* said forming [dies] *die* may be affixed *for movement with said block through a position in which a said forming plane of said die is generally parallel to said major plane of such strip material;*

leading control pin means extending from a leading portion of a said end *of each said die support block* along a first axis *parallel to said central axis;*

trailing control pins means extending from a trailing portion of a said end [,] *of each said die support block* along a second axis *parallel to and* spaced *apart* from said first axis of said leading control pin means;

said upper and lower roll units being spaced apart whereby said *strip* material may pass therebetween for [formation] *deformation* by said *forming* dies;

upper and lower leading cam surface means positioned to engage said leading pin means *of respective said die support blocks,* and having [a] predetermined leading cam [profile] *profiles;*



upper and lower trailing cam surface means positioned [to avoid said leading pin means, and] to engage [only] said trailing pin means *of respective said die support blocks,* and having [a] predetermined trailing cam [profile] *profiles* different from said leading cam [profile] *profiles,* whereby to support said die support blocks during *at least* a *first* portion of [the] *each said* rotary cycle whereby [a die] *said upper and lower leading cam surfaces and said upper and lower trailing cam surfaces have such configurations that dies* affixed to said [block] *blocks* on said *upper and* lower [unit may] *units* register with each other [and cooperate together] *and are disposed with their strip material-engaging planes mutually parallel and parallel to the strip material during engagement with the strip material* for [the] deformation of [the] *that* material *and immediately prior to and immediately after such engagement;* and,

bearing means for supporting said *upper and lower* units.

Re. 33,614

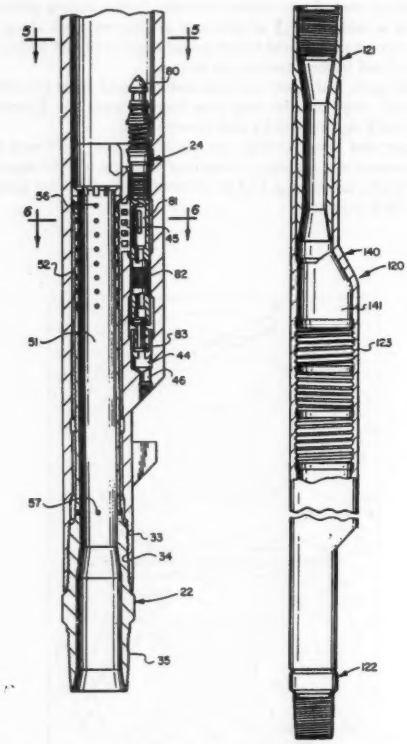
APPARATUS AND METHOD FOR ENHANCED OIL RECOVERY

Carl M. Schwab, Jr., Bakersfield; Clark E. Robison, and James B. Renfroe, Jr., both of Valencia, all of Calif., assignors to Otis Engineering Corp., Dallas, Tex.

Original No. 4,646,828, dated Mar. 3, 1987, Ser. No. 793,842, Nov. 1, 1985. Application for reissue Nov. 25, 1987, Ser. No. 793,842

Int. Cl.[5] E21B *43/24*

U.S. Cl. 166—303 **58 Claims**



55. A method of injecting steam at a selected mass flow rate into a production formation of a subterranean well having a tubing string traversing the production formation comprising the steps of:

supplying a steam flow to the surface end of the tubing string;

diverting the downwardly flowing steam into two radially separated flow components within the tubing;

directing one of said flow components into the inlet end of a choke passage, the outlet end of the choke passage being in communication with the production formation; and

accelerating the flow rate of said one flow component by said choke passage to a selected mass flow rate.

56. Apparatus for injecting steam into a production formation of a subterranean well at a selected mass flow rate comprising a tubular housing connectable in series relationship to the tubing string;

fluid diverting means in said tubular housing for dividing the steam flow into two radially separated components; and

means including a choke passage for accelerating the flow rate of one said flow component.

Re. 33,615

Patent Not Issued For This Number

Re. 33,616

LABEL BEARING CONTINUOUS BUSINESS FORM

Bernhard J. Welsch, Cromwell, Conn., assignor to Uarco Incorporated, Barrington, Ill.

Original No. 4,627,994, dated Dec. 9, 1986, Ser. No. 819,380, Jan. 16, 1986. Application for reissue Sep. 19, 1988, Ser. No. 245,514

Int. Cl.[5] B32B *3/06*

U.S. Cl. 428—41 **18 Claims**

10. A continuous business form comprising:

an elongated ply of label stock of a desired width and having one side coated with a pressure sensitive adhesive;

an elongated ply of release liner stock having a release side engaged with said adhesive on said one side;

said label stock ply including a narrow longitudinal strip of adhesive along one longitudinal edge and unengaged with said release liner; and

an elongated ply of record or message bearing stock having an edge adhered to said label stock at said narrow longitudinal strip of adhesive.

Re. 33,617

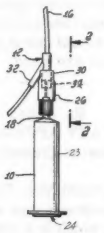
PROTECTED CANNULA

George B. Ogle, II, Alta Loma, Calif., assignor to International Medication Systems Limited, South El Monte, Calif.

Original No. 4,834,716, dated May 30, 1989, Ser. No. 74,721, Jul. 17, 1987. Application for reissue Apr. 4, 1990, Ser. No. 504,650

Int. Cl.[5] A61M *5/32*

U.S. Cl. 604—192 **7 Claims**



1. The combination of an intravenous administration set having a Y-site, a first tubing extending therefrom and adapted to connect to a patient-indwelling terminus, a second length of tubing extending from said Y-site with a terminal means adapted to be connected to a first source of intravenous solution, said Y-site having an inlet port, a hypodermic syringe adapted to hold a second intravenous solution, the syringe [having a cannula with a scarf at one end, said cannula being carried by a boss spaced from the scarf;] *including an elongated barrel with a boss at one end and plunger extending from the other end to bolus said second solution out of the barrel through the boss,* and [a] *an elongated and generally cylindrical* protective [device] *sheath* carried by *and removable from* said hypodermic syringe [and positioned around said cannula, said]*; an elongated* cannula [connecting] *having a first end adapted to connect with* the interior of the *barrel of the* hypodermic syringe; *a scarf at the other end of the cannula adapted to connect* with the tubing leading to the patient indwelling terminus; [said protective device having a] *the* generally cylindrical sheath [portion] having a first open end and surrounding said cannula over its length and extending beyond the scarf end of

said cannula at the first open end of said sheath, [said sheath being affixed at its other end to said boss, said cylindrical portion] *the first end of the sheath* having at least one cutout [at said first open end which snugly receives] *extending toward a second end of the sheath, the cutout being adapted to receive* by lateral reception[,] one of the tubings of said intravenous administration set, while said scarf has punctured the said inlet port of said Y-site; whereby the user, in making said combination, is protected by the sheath of said protective device from inadvertent puncture of the hands and fingers by said [scarf.] *scarf; the second open end of the sheath having a socket with an internal opening less than that of the first open end of the sheath to be adapted to make a slip fit over the boss of the hypodermic syringe.*

PLANT PATENTS

GRANTED JUNE 18, 1991

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,556
ROSE PLANT — AUSMAN

David C. H. Austin, Wolverhampton, England, assignor to David Austin Roses, Wolverhampton, England

Filed Nov. 9, 1989, Ser. No. 435,555
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—1 **1 Claim**

1. A new and distinct variety of rose plant of the shrub class, characterized as to novelty by its fully double flowers, of greyish—rose with light yellow streaks with abundant and continual blooming and the unusual blend of coloring and shaping of the flower being substantially as shown and described.

7,557
ROSE PLANT—AUSLEAF

David C. H. Austin, Albrighton, England, assignor to David Austin Roses, Albrighton, England

Filed Nov. 9, 1989, Ser. No. 435,556
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—1 **1 Claim**

1. A new and distinct variety of rose plant of the shrub class, characterized as to novelty by its fully double flowers of yellow and pale orange/red, with abundant and continual blooming and the unusual blend of colouring and shaping of the flower being substantially as shown and described.

7,558
MINIATURE POT ROSE NAMED DEVPRESA

Stanley G. Marciel, Aptos, Calif., assignor to DeVor Nurseries, Inc., Watsonville, Calif.

Filed Mar. 19, 1990, Ser. No. 495,902
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—7 **1 Claim**

1. The new and distinct miniature pot rose, substantially as herein shown and described, characterized by its profuse and continuous production of very small flowers borne on strong stems growing from a 4 in. pot and having an average height of about 19 cm. and abundant foliage when grown to the age of about 12 weeks.

7,559
MINIATURE ROSE NAMED DEVRICO

Stanley G. Marciel, Aptos, Calif., assignor to DeVor Nurseries, Inc., Watsonville, Calif.

Filed Apr. 9, 1990, Ser. No. 506,222
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—10 **1 Claim**

1. The new and distinct miniature rose variety substantially as herein shown and described, characterized by its profuse and continuous production of medium sized blooms on a small, compact bush having a height of about 17 cm. when grown on a 4 in. pot; the plant being free branching and having a vigorous, upright growth habit.

7,560
MINIATURE ROSE NAMED DEVCLAVEL

Stanley G. Marciel, Aptos, Calif., assignor to DeVor Nurseries, Inc., Watsonville, Calif.

Filed Apr. 11, 1990, Ser. No. 507,561
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—10 **1 Claim**

1. The new and distinct miniature rose variety, substantially as herein shown and described, characterized by its profuse and continuous production of relatively large flowers having a dark red coloration on a pot plant having a height of about 20 cm., a moderate quantity of foliage and a vigorous, upright, free branching growth habit.

7,561
ROSE PLANT NAMED TWODREAM

Jerry Twomey, Leucadid, Calif., assignor to DeVor Nurseries, Inc., Watsonville, Calif.

Filed Feb. 26, 1990, Ser. No. 488,738
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—18 **1 Claim**

1. The new and distinct rose variety substantially as herein shown and described, characterized by its profuse and continuous production of very large blossoms having a primary color appearance of Empire Rose bordered by large outside petals of a Spinel Red color; the plant having a vigorous, upright and free branching growth habit with abundant foliage.

7,562
ROSE PLANT NAMED DEVCALI

Stanley G. Marciel, Aptos, Calif., assignor to DeVor Nurseries, Inc., Watsonville, Calif.

Filed Dec. 18, 1989, Ser. No. 452,111
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—20 **1 Claim**

1. The new and distinct variety of greenhouse rose plant substantially as herein shown and described, characterized in particular by its continuous and profuse production of near tyrian purple flowers of medium size carried on strong upright stems, its free branching growth habit and its abundant production of foliage.

7,563
STRAWBERRY PLANT NAMED DARLIBELLE

Robert C. Hureau, Le Vaudoue, France, assignor to Societe Civile Darbonne, Milly-La-Foret, France

Filed Sep. 14, 1989, Ser. No. 407,049
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—49 **1 Claim**

1. A new variety of strawberry plant named Darlibelle, as illustrated and described.

PATENTS

GRANTED JUN. 18, 1991

ERRATA

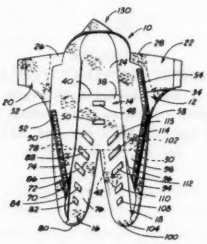
For CLASS	See PATENT NO.
452-177	5,023,974
452-135	5,023,975
291-032	5,023,985
70-456	5,024,078
164-169	5,024,161
137-219	5,024,254
222-001	5,024,347
277-035	5,024,364
236-093	5,024,378
294-068	5,024,397
425-121	5,024,558
425-406	5,024,559
446-268	5,024,611
604-036	5,024,612
604-004	5,024,613
604-119	5,024,615
604-192	5,024,616
606-047	5,024,617
606-053	5,024,618
439-631	5,024,627
604-390	5,024,672
428-001	5,024,850
424-052	5,024,855
252-174	5,025,069
568-033	5,025,090
568-601	5,025,093
568-623	5,025,094
568-652	5,025,095
570-206	5,025,110
568-909	5,025,113
392-451	5,025,131
219-010	5,025,489
313-479	5,025,490
340-825	5,025,491
342-044	5,025,492
342-374	5,025,493
357-023	5,025,494
358-140	5,025,495
358-153	5,025,496
358-425	5,025,497
361-156	5,025,498
364-165	5,025,499
370-085	5,025,500

PATENTS

GRANTED JUNE 18, 1991

GENERAL AND MECHANICAL

5,023,952
CLOTHING ITEM
Marcia R. Palmer, 2309 Coachlight, Edmond, Okla. 73013
Filed Apr. 6, 1989, Ser. No. 334,673
Int. Cl.[5] A41B *13/06*; A41D *11/06*
U.S. Cl. 2—69 **10 Claims**



1. A clothing item adapted to be worn by an individual comprising:

a body panel having an inner surface, an outer surface, a lower end and an upper end, a left side and a right side adapted to be wrapped generally about a substantial portion of the individual's torso;

a lower end panel having an inner surface, an outer surface, a left side and a right side; an upper end and a lower end, the lower end panel having an opened position wherein the lower end panel extends a distance from the body panel and a closed position wherein the lower end panel is folded over a portion of the body panel to a position wherein the inner surface of the lower end panel is disposed generally adjacent a portion of the inner surface of the body panel, the individual's torso being disposable on the inner surface of the body panel and the lower end panel being moveable generally toward the closed position to a position wherein the inner surface of the lower end panel is disposed generally adjacent a portion of the individual's torso and a portion of the body panel generally near the right side thereof being moveable over a portion of the individual's torso to a position wherein a portion of the inner surface of the body panel generally near the right side of the body panel is disposed generally over a portion of the outer surface of the lower end panel, and a portion of the body panel generally near the left side thereof being moveable over a portion of the individual's torso to a position wherein a portion of the inner surface of the body panel generally near the left side of the body panel is disposed generally over a portion of the outer surface of the lower end panel with the body panel covering a substantial portion of the lower end panel;

means for removably and adjustably connecting a portion of the left side of the body panel to a portion of the right side of the body panel or removably and adjustably connecting a portion of the body panel generally near the right side thereof to a portion of the lower end panel and removably and adjustably connecting a portion of the body panel generally near the left side thereof to a portion of the lower end panel whereby a size of a space encompassed by the body panel and the lower end panel is adjustably increasable or decreasable;

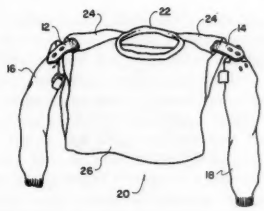
a right leg panel having a right side, a left side, an inner surface, an outer surface, an upper end and a lower end, a portion of the right leg panel generally at the right side of the right leg panel and extending a distance therefrom being connected to a portion of the lower end of the body panel generally at the right side thereof and extending a distance therefrom, and a portion of the right leg panel generally at the left side thereof and extending a distance therefrom being connected to a portion of the lower end of the lower end panel, the left side and the right side of the right leg panel being foldable to a position wherein the right side is disposed generally near the left side whereby a right leg space is formed which is shaped and adapted to receive the right leg of the individual;

means for removably and adjustably connecting the left side of the right leg panel to the right side of the right leg panel whereby the size of the right leg space is increasable and decreasable;

a left leg panel having a right side, a left side, an inner surface, a outer surface, an upper end and a lower end, a portion of the left leg panel generally at the left side of the left leg panel and extending a distance therefrom being connected to a portion of the lower end of the body panel generally at the left side thereof and extending a distance therefrom, and a portion of the left leg panel generally at the right side thereof and extending a distance therefrom being connected to a portion of the lower end of the lower end panel, the left side and the right side of the left leg panel being foldable to a position wherein the right side is disposed generally near the left side whereby a left leg space is formed which is shaped and adapted to receive the left leg of the individual, the lower end panel being connected to the body panel by way of the right leg panel and the left leg panel at a position generally midway between the left side and the right side of the body panel; and

means for removably and adjustably connecting the left side of the left leg panel to the right side of the left leg panel whereby the size of the left leg space is increasable and decreasable.

5,023,953
GARMENT AND PROTECTIVE SLEEVE
Laurence A. Bettcher, Huron, Ohio, assignor to Bettcher Industries, Inc., Birmingham, Ohio
Continuation of Ser. No. 537,059, Jun. 12, 1990, abandoned.
This application Dec. 12, 1990, Ser. No. 625,691
Int. Cl.[5] A41D *27/10, 13/08, 27/12*
U.S. Cl. 2—126 **12 Claims**



1. The combination of a sleeveless shirt and a detachable cut-resistant protective sleeve for use in the meat packing industry, comprising:

a) a sleeveless shirt having

i) a crew neck,

ii) a single front panel and a single back panel, each substantially rectangular when flat and of a thin, light weight, low friction, wear-resistant, mesh material having significant give or stretch, and stitched together to form side seams of the shirt that extend from a tail end toward an upper end and that terminate before the upper end of the shirt to provide side openings at the

upper end of the shirt for a wearer's arms to extend therethrough, the front panel forming a partial boundary of the neck,

iii) a single yoke panel extending the width of the front and back panels, located essentially behind the neck and forming the remaining boundary of the neck and in part forming the side openings, said yoke panel being of a woven relatively heavy weight material and relatively non-stretchable compared to the front and back panels, and

iv) two elongated tabs of elasticized webbing, each fastened at one end to the yoke, one on each side of the shirt and extending out from the shirt at the top of the side opening, substantially perpendicular to an edge of the yoke that in part forms the respective side opening and for a distance less than the distance from the neck to the side opening; and each having two fasteners that are each one part of a two-part system, the two fasteners being aligned and spaced along the length of the tab; and

b) an elongated protective tubular sleeve separable from the shirt, knit from a high strength cut-resistant yarn comprised of a core having a stainless steel strand 0.002 to 0.004 inches in diameter and a core of high strength stretched polyethylene of approximately 650 denier, a first wrap about the core of approximately 400 denier high strength aramid fiber, a second wrap of approximately 375 denier high strength stretched polyethylene fiber and a third wrap of approximately 440 denier polyester, said sleeve having

i) an elasticized cuff portion at one end,

ii) a non-elasticized other end with a placket and an elasticized tab secured at one end to the sleeve to extend across the placket and having a fastener at a free end to attach the free end to the sleeve to tighten the non-elasticized end,

iii) four fasteners, each being the other part of the two-part system, secured to the sleeve at a location substantially diametrically opposite from the placket, arranged in two rows of two fasteners each, the rows being spaced peripherally about the sleeve and the fasteners of each row being spaced longitudinally of the sleeve.

5,023,954

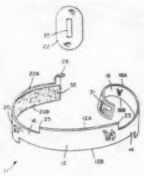
FOREHEAD, TEMPLE, EAR, AND NECK PROTECTOR

Calvin R. Lyons, 7 Worthington Ct., Sterling, Va. 22170

Filed Dec. 18, 1989, Ser. No. 451,561

Int. Cl.[5] A42B *1/16*

U.S. Cl. 2—174 **19 Claims**



1. A protective device in the form of a band which covers the ears and skin located just below the entire hairline, comprising:

(a) a band of flexible material adapted to be worn around the head of a wearer, the band comprising a forehead protector which includes an upwardly extending cover portion to meet the forehead hairline of a wearer, a temple protector portion connected with each end of the forehead protector, each temple protector portion having a smaller width than the width of the forehead protector, an ear protector portion slidably carried on each temple protector portion for sliding movement therealong, and a neck protector portion connected with each temple protector portion to simultaneously cover the skin of the wearer immediately below the hairline at the wearer's forehead, temples, ears, and neck;

(b) adjustable connection means for joining the neck protector portions of said band of flexible material together to complete a closed loop structure around the wearer's head and to permit adjustability of the circumferential length of the device.

5,023,955

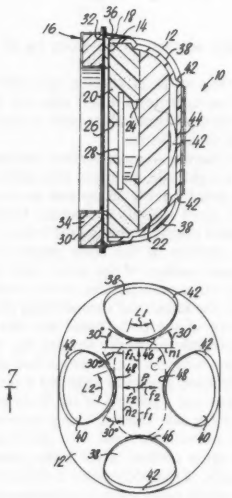
IMPACT-ABSORBING SOUND-ATTENUATING EARCUP

John A. Murphy, II, and Charles A. Westgate, both of Carbondale, Pa., assignors to Gentex Corporation, Carbondale, Pa.

Filed Apr. 13, 1989, Ser. No. 337,407

Int. Cl.[5] A41D *21/00*

U.S. Cl. 2—209 **6 Claims**



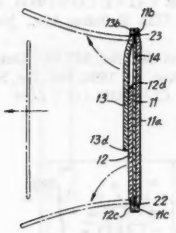
1. A sound attenuating earcup for insulating the ear of a wearer from ambient sound while inhibiting transmission to the wearer's head through the earcup of shocks of impact from severe bumps or the like which might otherwise injure the head of the wearer comprising a discrete hollow cup-shaped crushable shell forming a cavity for the wearer's ear to provide a sound-attenuating chamber around the ear, said shell having a periphery toward which stress resulting from a shock of impact travels along a path from a point of impact adjacent to the center of the shell, said shell being formed with stress concentrators, each of which has an appreciable extent in a direction across said path from said point of impact toward said periphery, said shell being formed of such a material and of such a thickness as to maintain its rigidity in ordinary use and to collapse upon impact from such severe bumps or the like to dissipate energy at an applied force less than that required to crush the skull of the wearer, said stress concentrators forming recesses in said shell, the surface of said shell having a center point, said recesses having edge portions extending generally tangentially relative to a line perpendicular to said path of stress resulting from a force applied at said point.

5,023,956

ELONGATED ARTICLE OF APPAREL

Flo Fox, New York, N.Y., assignor to Peter Weiss, New York, N.Y.

Filed Feb. 28, 1990, Ser. No. 487,352
Int. Cl.[5] A41F 9/00
U.S. Cl. 2—338 6 Claims



1. An elongated article of apparel adapted to at least substantially encircle a portion of the body of a wearer of the article of apparel, comprising three substantially longitudinally coextensive elongated strips of self-cohesive, pliable plastic sheeting, a first of the strips being transparent and having a surface forming an obverse face of the article of apparel and having mutually opposed later edges, the second and third strips each having a lateral edge attached to a respective one of the lateral edges of the first strip, the second and third strips each being narrower than the first strip and each having a free lateral edge, the combined widths of the second and third strips being greater than the width of the first strip whereby the second and third strips have mutually overlapping lateral portions, contiguous with their respective free lateral edges, the first, second and third strips thereby forming a transparent enveloping structure, the pliability of the sheeting permitting the overlapping portions of the second and third strips to be manually peeled away from each other thereby to provide access to the interior of the enveloping structure for the insertion or removal of flat decorative matter and then to be mutually overlapped again and the self-cohesiveness of the plastic sheeting causing the overlapping portions to cohere sufficiently to remain sealed when not being subjected to said manual peeling.

5,023,957

PANTY HOSE FOR WEARING UNDER AN ABBREVIATED OUTER GARMENT

Mary A. Harvey, 2358 Cloister Ct., Troy, Mich. 48084

Filed Dec. 20, 1990, Ser. No. 453,786
Int. Cl.[5] A41B 9/04
U.S. Cl. 2—409 11 Claims

5. A panty hose garment for wearing over the legs and lower torso area of a wearer and made from a stretchable, sheer material such that when the wearer puts on the garment it will ride on top of the wearer's hips and be stretched so the wearer's skin is clearly visible, through the material, said panty hose garment comprising:

a panty portion including a crotch portion, a front portion and a back portion substantially enclosing the wearer's lower torso area between the wearer's hips and crotch;

two leg portions extending from both sides of the crotch portion;

a waistband completely encircling the upper edge of the panty portion and having a width which is readily concealable under a G-string type garment, said waistband having a V-shaped configuration across the front portion of the panty portion such that the waistband is supported by the wearer's hips and falls substantially below the wearer's navel at the apex of the V, and the apex of the V-shape front portion falling substantially below the lowest point of the back portion; and

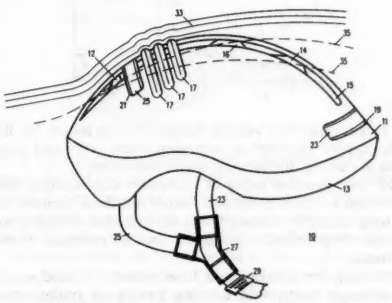
a crotch panel within the crotch portion, said crotch panel having a teardrop shape such that the wider end of the crotch panel is towards the front portion of the panty hose garment.

5,023,958

AERODYNAMIC BICYCLE HELMET

Stephen A. Rotzin, 32 Las Vegas Rd., Orinda, Calif. 94563

Filed Sep. 1, 1989, Ser. No. 402,605
Int. Cl.[5] A42B 3/00
U.S. Cl. 2—411 10 Claims



1. A bicycle safety helmet comprising a concave body internally shaped to conform to and be worn on a user's head and having stabilizing means for stabilizing said helmet on the user's head, said stabilizing means comprising:

at least one ridge transversely disposed on a forward portion of the external surface of said helmet body;

ventilation means including at least one front aperture formed in a forward portion of said helmet body and at least one rear aperture formed in a rear portion of said helmet body, said ventilation means providing an airflow through said helmet body, the airflow entering the helmet body through said front aperture and exiting the helmet body through said rear aperture and flowing over said rear portion of said helmet body;

helmet retention straps including a forward strap and a rear strap, said forward and rear straps being routed through apertures formed in said helmet body and over the external surfaces of a forward portion of said helmet body and said rear portion, respectively, said retention straps coupled together in a buckle means under the chin of a user; and

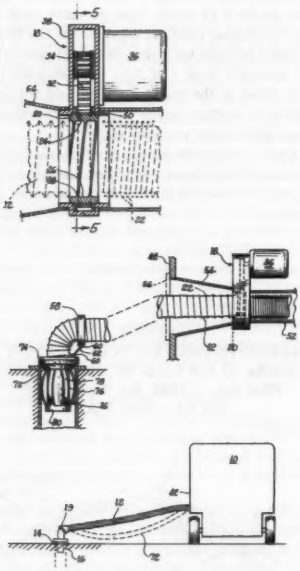
strap adjustment means for adjusting said helmet retention straps.

5,023,959

EXTENDABLE WASTE HOSE SYSTEM

Albert E. Mercer, Jacumba, Calif., assignor to Thetford Corporation, Ann Arbor, Mich.

Filed Apr. 3, 1989, Ser. No. 331,965
Int. Cl.[5] E03D *1/00*
U.S. Cl. 4—321 17 Claims



1. In a recreational vehicle having storage means for liquid waste, a hose member in communication with said storage means for use in discharging waste therefrom,

said hose member being of accordion construction with a ribbed external surface to enable said hose member to be longitudinally extended into an extended dumping mode and longitudinally collapsed into a compact stowage mode,

a housing for stowing said hose member in said compact stowage mode, said housing having an outlet opening through which said hose is extendable,

hose drive means located externally of said hose member adjacent said housing and physically engaging said hose member ribbed external surface for selectively extending said hose out of said housing through said opening into said hose member extended dumping mode and retracting said hose member through said opening back into said housing into said compact stowage mode and,

said hose member having an inner end for connection to said waste storage means and an outer end including a coupling for insertion into a waste inlet of a waste dump station.

15. A waste hose system comprising: a storage housing

a longitudinally collapsible hose having a longitudinal axis, rib means forming a ribbed exterior surface on said hose of alternating ridges and grooves and coupling means at one end of said hose for coupling said hose to a waste inlet of a waste dump station, said hose being axially moveable between a collapsed position inside of said storage housing and an extended in use position; and

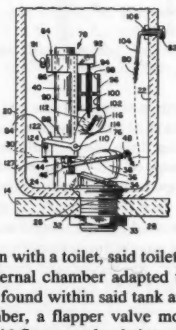
drive means located externally of said hose member adjacent said housing and incluading a rotatable drive member extending into said grooves and frictionally engaging said hose so that rotation of said drive member in one direction moves said hose longitudinally to said collapsed position and rotation of said drive member in the other direction moves said hose longitudinally to the extended position so that the length of hose between said coupling means and drive means can be varied to thereby prevent sagging in the hose when in the extended in-use position.

5,023,960

TOILET FLAPPER VALVE CONTROL APPARATUS

Srinkarn Ratanagsu, 7752 Bellaire Ave., North Hollywood, Calif. 91605

Continuation-in-part of Ser. No. 425,599, Oct. 23, 1989. This application Apr. 23, 1990, Ser. No. 512,427
Int. Cl.[5] E03D *1/35, 1/14*
U.S. Cl. 4—393 3 Claims



1. In combination with a toilet, said toilet having a tank, said tank having an internal chamber adapted to contain water, a discharge opening found within said tank and connecting with said internal chamber, a flapper valve mounted on said discharge opening, said flapper valve being movable between an open position and a closed position, said open position permitting flow of water from said internal chamber through said discharge opening, said closed position preventing flow of water through said discharge opening, an overflow tube fixedly mounted to said tank, said overflow tube located within said internal chamber directly adjacent said discharge opening, when said flapper valve is located in said open position said flapper valve is designed to remain in said open position until said internal chamber is almost empty of water, the improvement comprising:

flapper valve control means mounted on said overflow tube, said flapper valve control means to contact said flapper valve and cause said flapper valve to move from said open position to said closed position prior to completely emptying of said internal chamber of water, said flapper valve control means including a mounting housing, a float block movably mounted on said mounting housing, said float block having an interior chamber, said interior chamber being adapted to contain a quantity of water, said quantity of water combined with the weight of said float block to be sufficient to cause said flapper valve to move to said closed position prior to complete emptying of water within said internal chamber, said float block having an air chamber, said air chamber to cause said float block to float when immersed within the water within said internal chamber; and

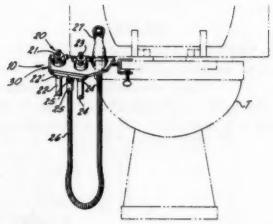
said flapper valve control means further including an arm assembly, said arm assembly being pivotally mounted on said mounting housing, said arm assembly being movable between an at-rest position and a latched position, said at-rest position being when said arm assembly is in physical contact with said flapper valve and as said flapper valve moves between said open and closed positions said arm assembly moves with said flapper valve maintaining said physical contact, said latched position being when said float block latchingly connects with said arm assembly permitting movement of said flapper valve away from said arm assembly which includes said closed position.

5,023,961

BIDET ACCESSORY

Nelson A. Alonso, 1701 SW. 32 Ct., Miami, Fla. 33145

Filed Dec. 5, 1988, Ser. No. 279,741
Int. Cl.[5] A61H *35/00*
U.S. Cl. 4—448 **5 Claims**



1. A bidet accessory for installation in two piece toilets, the toilets having flanged section in the rear and the bidet accessory being connected to hot and cold water supplies, the bidet accessory comprising:

A. supporting means;

B. valve means connected to said hot and cold water supplies for regulating the temperature of the water and further including an outlet through which said temperature regulated water flows and said valve means being mounted in said support means;

C. flexible conduit means having two ends and connected to said outlet at one of the ends;

D. sprayer means connected at the other end of said conduit means;

E. mounting means for rigidly mounting said supporting means to said flanged section of a toilet comprising a J-shape bar member having curved and long ends, said curved end being rigidly attached to said supporting means, a U-shape bar member having curved and legged ends, whereby said long end of said J-shape bar is perpendicularly and slidably attached by a first fastening means to said curved end of said U-shape bar member, said legged end of said U-shape bar member being rigidly attached to an attaching means, and said attaching means being removably attachable to said flanged section of a toilet, the mounting means being assembled so that said J-shape bar member cooperates with the U-shape bar member allowing the supporting means to be slidably adjustable with respect to the toilet.

5,023,962

BEDSIDE COMMODE STATION FOR INVALID PATIENTS

Robert C. Steljes, P.O. Box 1479, Marion, N.C. 28752-1479

Filed Nov. 5, 1990, Ser. No. 609,478
Int. Cl.[5] A47K *11/06;* **A61G** *7/08*
U.S. Cl. 4—480 **8 Claims**

1. A bedside commode station for location adjacent a patient's bed comprising in combination,

a rigid continuous sheet of material forming a horizontal platform defining a peripheral edge,

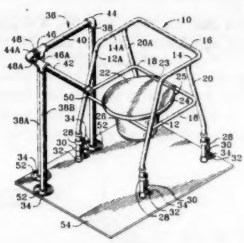
a bedside commode including a removable container and first frame means fastened to said platform for supporting said container above said platform, said first frame means being spaced from said peripheral edge,

a handrail and second frame means for supporting said handrail to said platform,

said handrail being spaced horizontally from said commode on said platform,

said platform being of sufficient size to support said handrail at a sufficient distance from said commode to allow a patient to freely move between said handrail and said commode,

said platform being of sufficient size to allow said peripheral edge adjacent said patient's bed to partially extend under said bed when said first frame is against said bed,



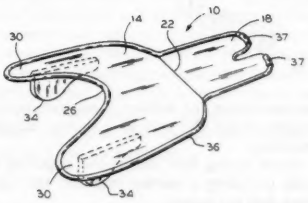
and the platform being of sufficient rigidity to enable said patient to grip the handrail and pull up to a standing position on said platform without the platform becoming unstable.

5,023,963

SELF ADJUSTING AND SELF SECURING SHAMPOO TRAY

Naomi R. Vogel, 2105 Berrywood La., Bloomington, Ill. 61704

Filed Jun. 21, 1990, Ser. No. 541,723
Int. Cl.[5] A45D *44/08*
U.S. Cl. 4—521 **12 Claims**



10. A self adjusting and self securing shampoo tray for catching and discharging into a basin the run-off from shampoo operations of recipients of varying heights while the recipients may be seated in an upright position comprising:

a rigid body having run-off containing and directing first and second sections, the first section of the rigid body having a top and a bottom and a rim on its top defining a run-off containing periphery adapted to channel run-off to the second section of the rigid body for discharge into a basin during a shampoo operation;

a hinge joining the first and second sections in a manner allowing the first section to swing relative to the second section for accommodating recipients of varying heights;

the first section having a free end opposite the hinge with an arcuate neck receiving opening formed integrally therein and defining opposing channels disposed on each side of the neck receiving opening;

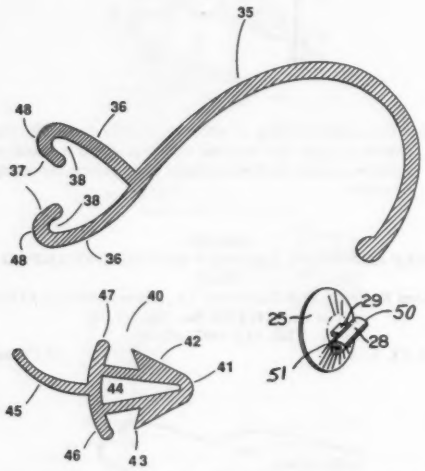
the second section having a free end opposite the hinge, the first and second sections together being of a length such that the free end of the second section will engage an inner surface of the basin to support the tray between the recipient and the basin; and a pair of elongated supports each depending from respective ends of the opposing channels and extending toward and generally perpendicular to the hinge, the supports being of greatest height proximate to the free end of the first section and of decreasing height as they extend toward the hinge, the height and slope of the platforms being sufficient to maintain the neck receiving opening against a recipient's neck while directing run-off flow towards the second section of the rigid body during a shampooing operation substantially independent of the recipient's height.

5,023,964

SHOWER CURTAIN RETAINER

John Unsworth, Ste. 211, 14525 - 92 Street, Edmonton, Alberta, Canada T5E 3S7

Filed Jan. 25, 1990, Ser. No. 470,232
Claims priority, application Canada, Jan. 25, 1989, 589113
Int. Cl.[5] A47K 3/22
U.S. Cl. 4—558 4 Claims



1. A retainer device for holding a shower curtain in the closed position against the wall of a shower enclosure, the device comprising:

coupler means having first and second opposing sides, the first side including a suction cup and the second side including first lug means;

a longitudinally elongate sealing barrier having third and fourth opposing sides, the third side including a flexible curved body and the fourth side including second lug means extending transversely away from the body; and

a longitudinally elongate and transversely arcuate handle having a first side and a second side, the first side defining socket means for releasably receiving both the first lug means and the second lug means together with the shower curtain, the second side defining said handle;

whereby the shower curtain is releasably connectable between the coupler means and the handle, and the coupler means and therefore the shower curtain are releasably connectable to the wall.

5,023,965

SHOWER UNIT PANEL

Gunter Reichel, Kreuzstrasse 19, D-3563 Dautphetal 5, Fed. Rep. of Germany

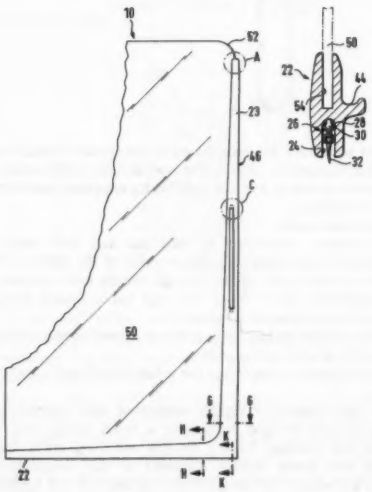
Filed Oct. 12, 1989, Ser. No. 421,676
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1989, 8903013[U]; Aug. 3, 1989, 8909357[U]
Int. Cl.[5] A47K 3/22, 3/08
U.S. Cl. 4—607 14 Claims

1. A panel for the closure of shower units and the like that has a front side and a back side and which is adapted to be vertically mounted by a hinged supporting means, said panel including

(a) a pane (50) having a front side and a backside as well as top, bottom, inner and outer edges,

(b) an integral component bordering both the bottom edge and at least a part of the outer edge of said pane (50),

(c) a profiled ledge (22,23) containing a drain channel (44) for water that is a part of said integral component that is on the backside of the panel (10) and which extends along both the bottom edge of said pane (50) and at least a part of a corner formed by the bottom and outer edges of said pane (50), said profiled ledge (22, 23) sloping continuously downwardly from a point adjacent said outer edge of said pane (50) towards said inner edge of said pane so that water arriving in said channel will flow toward the interior of the shower unit regardless of whether the shower door is open or closed, and



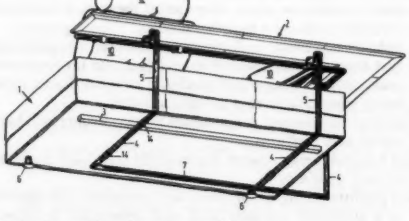
(d) sealing means associated with the bottom edge of said integral component to seal off the passage of water from the backside to the front side of said panel.

5,023,966

PIECE OF FURNITURE

Jens J. Eilersen, "Villa Malou" - Domaine de la Veroninere, Valbonne, France 06560

Filed Jul. 31, 1990, Ser. No. 560,169
Claims priority, application Denmark, Aug. 10, 1989, 3935/89
Int. Cl.[5] A47C 17/13, 20/00
U.S. Cl. 5—17 14 Claims



1. A piece of furniture, comprising:

a stationary back rest part having at least a substantially horizontal portion for resting on a floor;

a movable part for sitting or resting thereon, said movable part being subject to resting at least partially on said substantially horizontal portion, said movable part including support means for contacting with said substantially horizontal portion, said support means permitting relative motion between said back rest part and said movable part in any direction substantially parallel with said substantially horizontal portion.

5,023,967

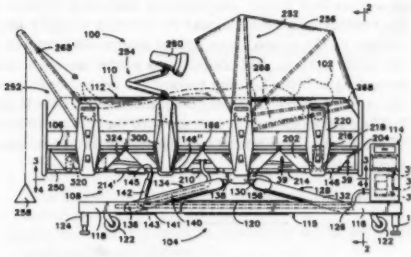
PATIENT SUPPORT SYSTEM

Robert Ferrand, Burlingame, Calif., assignor to American Life Support Technology, Burlingame, Calif.

Continuation of Ser. No. 172,264, Mar. 23, 1988, abandoned. This application Apr. 20, 1990, Ser. No. 511,842

Int. Cl.[5] A61G 7/06

U.S. Cl. 5—62 **28 Claims**



1. A patient support system comprising:

a base frame supportable relative to a floor;

an elongate platform extending along a longitudinal axis and relative to a platform plane generally parallel to the plane of the torso of a patient disposed in a supine or prone position relative to said platform along said longitudinal axis; and

means for supporting said platform relative to said base frame comprising means defining three axes of pivoting of said platform relative to said frame, characterized in that none of said three axes are perpendicular to said platform plane, and on each axis there exists a first point that is closest to a first of the other axes and a second point, spaced from the first point, that is closest to the second of the other axes, and means for pivoting said platform independently about each of said three axes for varying the pitch, roll and distance of said platform relative to said base frame.

5,023,968

REMOVABLE LITTER CHAIR INSERT

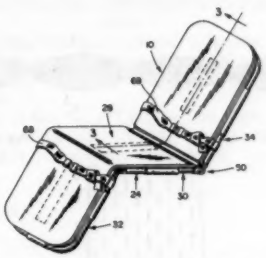
Phillip C. Diehl, and James R. Coble, both of P.O. Box 694, Altoona, Pa. 16603

Filed Jul. 11, 1989, Ser. No. 377,962

Int. Cl.[5] A61G 1/00, 1/04

U.S. Cl. 5—82 R **4 Claims**

4. A litter chair insert for use with an ambulance cot and convertible from a straight stretcher to a chair configuration comprising a generally rectangular frame enclosing an open area, a flexible liner in the open area attached to the frame, said frame including a center section, a foot section and a head section, lockable hinge means interconnecting the center section and foot section and lockable hinge means interconnecting the center section and head section with the lockable hinge means enabling the sections to be oriented in alignment with each other to form a stretcher or in angular relation to each other to form a chair to enable a patient to be more effectively transported down stairways, through halls having confined areas and the like, each of said lockable hinge means including a female component and a male component, said female hinge component including an axial recess receiving an axial projection on the male hinge component, a transverse pin interconnecting said female hinge component and said male hinge component to enable the hinge components to move pivotally in relation to each other when moving between aligned and angular positions, and a locking member movably mounted on one of said hinge components in spaced but adjacent relation to the pin for locking engagement with the other hinge component in the aligned and angular positions of the hinge components, said locking hinge being confined to an area adjacent said transverse pin thereby leaving the areas above and below



the frame unobstructed, said recess on the female hinge component and said projection on the male hinge component including engageable transverse surfaces parallel to and in spaced but adjacent relation to said pin for limiting pivotal movement of the female and male hinge components to an aligned position in one direction of pivotal movement and an angular position in the other direction of pivotal movement, said hinge component lockingly engaged by the movable locking member including transverse surface areas in addition to those limiting pivotal movement engageable by said locking member when said female and male hinge components are in their aligned and angular positions.

5,023,969

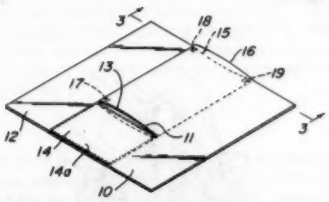
NOVEL BLANKET/SHEET FOR A DOUBLE BED

Douglas J. Nattrass, 80 Queens Cir., Chalfont, Pa. 18914

Filed Apr. 9, 1990, Ser. No. 506,225

Int. Cl.[5] A47G 9/02

U.S. Cl. 5—486 **14 Claims**



10. The combination comprising:

(a) at least one integrally formed cloth member for fitting on top of a double bed;

(b) at least one slit formed in said cloth member which does not destroy its integrity;

(c) means located upon said member and attached along said formed cut to form flaps; and

(d) said flaps in combination with a portion of said cloth member being utilized to maintain the comfort zone of persons occupying said double bed or alternatively being independently controllable in a sideway or a downward direction without effecting the comfort zone of an opposite person.

5,023,970

BED COVER

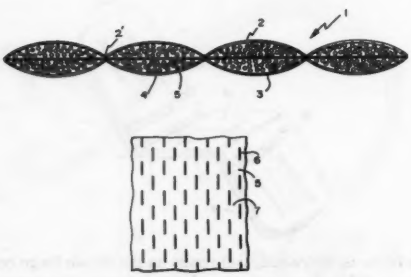
Günter Tesch, Avenue Jean-Marie-Musy 15, Fribourg, Switzerland CH-1700

Filed Mar. 14, 1989, Ser. No. 322,994

Claims priority, application Switzerland, Mar. 28, 1988, 01130/88

Int. Cl.[5] A47G *9/00*

U.S. Cl. 5—502 17 Claims



1. A cover, in particular a bed cover, comprising:

a case having two outer sheets;

a filling between said two outer sheets; and

a single thin sheet located between said two outer sheets, said single thin sheet being formed from a plastic material and including a plurality of slits arranged in a predetermined patterned distribution over substantially the entire surface thereof, an opening formed by each slit in said thin sheet is such that the openings are closed when the thin sheet is not stressed.

5,023,971

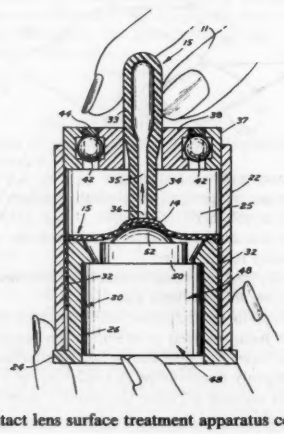
CONTACT LENS SURFACE TREATMENT APPARATUS

Larry W. Pompe, 115 ½ E. Litchfield Ave., Willmar, Minn. 56201

Continuation-in-part of Ser. No. 262,274, Oct. 25, 1988, abandoned. This application Aug. 28, 1989, Ser. No. 398,986

Int. Cl.[5] G02C *13/00*

U.S. Cl. 15—97.1 26 Claims



1. A contact lens surface treatment apparatus comprising:

a housing having a first open end and a second open end generally aligned with the first open end;

a surface treatment pad retainer having side walls of dimension and shape to be inserted in the first end of the housing, said retainer having a central opening, a surface treatment pad having a central portion spanning the central opening of the retainer and having an edge extending from the central portion in overlapping relationship to the side walls of the retainer such that the edge is lodged between the side walls of the retainer and the inner walls of the first opening of the housing to frictionally hold the retainer in the housing;

a contact lens holder;

a contact lens holder mount having a outer portion and an inner portion rotatable with respect to the outer portion, said outer portion having an outer dimension and size to fit in the second open end of the housing in a light friction fit, said outer portion being releasably installed in the second open end of the housing;

said contact lens holder assembled to said inner portion of the contact lens holder mount for rotation with the inner portion of the contact lens holder mount with respect to the outer portion, said contact lens holder having a stem extending into the housing toward the central opening of the retainer, said stem having a tip and means on the tip for holding a contact lens in contact with the pad for rotation of the contact lens holder to perform a surface treatment procedure.

5,023,972

SPARE WIPER ELEMENT

Kurt Bauer, Ingersheim, and Eckhardt Schmid, Bietigheim-Bissingen, both of Fed. Rep. of Germany, assignors to SWF-Auto-Electric GmbH, Bietigheim-Bissingen, Fed. Rep. of Germany

Filed Aug. 11, 1989, Ser. No. 393,352

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1988, 3827875

Int. Cl.[5] B60S *1/02*

U.S. Cl. 15—250.42 14 Claims

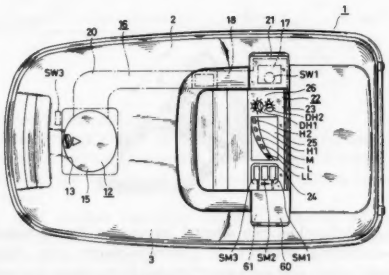
1. A spare wiper element for a wiper blade, for motor vehicles, comprising a wiper rubber having a basic body and a wiper lip, which is held on the basic body by way of a tiltable web, and comprising two spring bars each of which is laterally inserted in an associated longitudinal groove worked into the basic body and are protected there against longitudinal displacement by integral holding elements on the wiper rubber and after the final assembly of the wiper blade are secured by holding claws on a supporting yoke system transversely to the longitudinal direction of the wiper rubber, wherein the basic body (11) of the wiper rubber (10) is encompassed by at least one holding clamp (30, 31) which secures the spring bars (21) in the longitudinal grooves during assembly of the wiper and wherein said holding clamp is removable after assembly of the wiper assembly by sliding it in said longitudinal direction.

5,023,973

VACUUM CLEANER

Yasuyuki Tsuchida, Hyogo, and Yuki Nakanishi, Kasai, both of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Dec. 18, 1989, Ser. No. 452,594
Claims priority, application Japan, Dec. 19, 1988, 63-320938
Int. Cl.[5] A47L *9/28*
U.S. Cl. 15—319 **7 Claims**



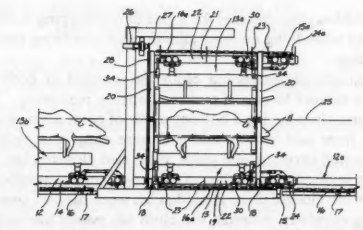
1. A vacuum cleaner comprising:
a cleaner body provided with an air inlet and an air outlet;
a dust chamber provided in said cleaner body and communicating with said air inlet;
a housing provided in said cleaner body, communicating with said dust chamber and said air outlet and accommodating an electric air blower;
means for selecting inlet suction force levels produced by said electric air blower;
a pressure sensor in communication with the suction side of said electric air blower;
means for comparing an output of a detected pressure from said sensor with a reference value;
means for varying said reference value in proportion to the suction force level selected by said selecting means; and
means for indicating an accumulated state of dust in said dust chamber based upon the comparison result from said comparing means.

5,023,974

ROTATION METHOD AND APPARATUS

Kenneth G. Coles, Woollahra, Australia, assignor to Conveyor Co. of Australia Pty. Ltd., Waterloo, Australia

Filed Jan. 31, 1990, Ser. No. 472,717
Claims priority, application Australia, Feb. 1, 1989, PJ2501
Int. Cl.[5] A22B *5/00*
U.S. Cl. 452—177 **21 Claims**



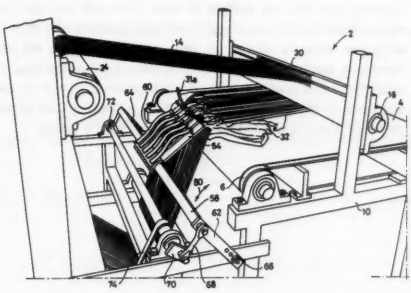
1. A method of rotating an article being conveyed on a first carrier travelling a track of a conveyor system, characterised by comprising the steps of:
(a) stopping said first carrier at a first longitudinal section of track;
(b) providing a second carrier on a second longitudinal section of track, the second carrier and second section being displaced at an angle relative to the first carrier and first section respectively in a plane normal to a longitudinal axis of rotation;
(c) keeping said angle substantially constant while rotating the first and second sections about the axis of rotation through said angle, such that the positions of the second section and second carrier after the rotation are substantially the same as the positions of the first section and first carrier respectively prior to the rotation and the article is rotated onto the second carrier.

5,023,975

BONING APPARATUS FOR REMOVING RIBS FROM A BELLY

Rudolf J. Van Der Hoorn, Pylkruidhof 5, Nuenen, Netherlands 5672 BK ; Martinus J. Jaspers, Bloemhoefstraat 6, Nuenen, Netherlands 5674 NT , and Johannes J. Bak, Utrecht, all of Netherlands

Continuation of Ser. No. 277,225, Nov. 29, 1988, abandoned. This application Sep. 15, 1989, Ser. No. 408,405
Claims priority, application Netherlands, Nov. 30, 1987, 8702872
Int. Cl.[5] A22C *17/04*
U.S. Cl. 17—46 **16 Claims**



1. Boning apparatus, for removing the ribs from a belly, comprising a flexible and drivable support surface, guided over a guide roller, for supporting the belly to be processed, a number of cords or strings disposed thereabove and side by side in the direction of the width thereof which include an acute angle with said surface in the direction of the guide roller, are guided over said roller and are driven in the same direction as the support surface, and a striker mechanism which is positioned in front of the guide roller, covering the part of the belly which is to be boned, and can be driven in a reciprocating movement in the direction of the guide roller, and acts on the ribs protruding from the belly.

5,023,976

FEED TABLE OF A DRAWFRAME ARRANGEMENT

Urs Meyer, Niederglatt; Niklaus Gartenmann, Winterthur, and Roland Fischer, Zürich, all of Switzerland, assignors to Maschinenfabrik Rieter AG, Winterthur, Switzerland

Filed Nov. 3, 1989, Ser. No. 431,576
Claims priority, application Switzerland, Nov. 3, 1988, 048888/88
Int. Cl.[5] D01G *31/00*
U.S. Cl. 19—0.25 **31 Claims**

1. A feed table for continuously feeding slivers to a textile processing machine, comprising:
(a) a plurality of sliver cans arranged in a row for supplying primary slivers to said textile processing machine;
(b) a plurality of reserve sliver cans disposed adjacent to said sliver cans for supplying reserve slivers to said textile processing machine;
(c) a first narrow flexible conveyor belt for each of said

primary slivers, said conveyor belts being supported by a driven roller and an idler roller for conveying said slivers to a common delivery point;

(d) a second flexible conveyor belt for each of said reserve slivers, said conveyor belts being supported by a driven support roller and an idler roller, adjacent to said first conveyor belt for alternately conveying said reserve slivers to said common delivery point;

(e) first detection means for detecting the presence of each of said primary slivers and said reserve slivers, individually;

(f) second detection means for detecting the absence of said primary slivers and said reserve slivers, individually;

(g) a continuously driven common conveyor belt for receiving said slivers at said common point and for conveying said slivers to said textile processing machine; and

(h) control means for receiving signals from said first and second detecting means, including means for selectively driving said driven rollers of said first and second conveyor belts to alternately deliver said primary sliver or its adjacent reserve sliver to said common point on said common conveyor, said control means commencing the delivery of a leading end of said reserve sliver to said common point at the same time that a trailing end of said primary sliver passes said common delivery point.

5,023,977

SLIVER GUIDE FOR A TEXTILE MACHINE

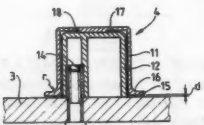
Helfried Lang, Winterthur, Switzerland, assignor to Riter Machine Works, Ltd., Winterthur, Switzerland

Filed Jun. 28, 1989, Ser. No. 372,315

Claims priority, application Switzerland, Jul. 4, 1988, 02536/88

Int. Cl.[5] D01G *19/00*

U.S. Cl. 19—115 R **21 Claims**



1. A textile machine comprising

a table; and

a plurality of sliver guides for guiding at least one sliver over said table, each said guide including an inner element fixedly mounted on said table and a sleeve rotatably mounted on said inner element for rotation about an axis perpendicular to said table to receive and deflect a sliver passing thereover from one direction into a second direction, said sleeve having a radially outwardly projecting flange adjacent a surface of said table to support a sliver thereon.

5,023,978

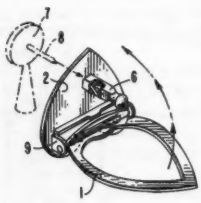
SCARF CLIP ADAPTER FOR BROOCH OR EARRING

Bobbie J. Thompson, Charlottesville, Va., and Tamela T. Thompson, 34 Canterbury Rd., Charlottesville, Va. 22901, assignors to Tamela T. Thompson, Charlottesville, Va.

Filed Jul. 7, 1989, Ser. No. 376,832

Int. Cl.[5] A41F *1/00*; A44B *21/00*

U.S. Cl. 24—3 L **6 Claims**



1. A neckerchief clip adapter having, as the neckerchief-ends-encircling member, a generally-planar rear element through which said ends are threaded from above downward and from front to rear and which carries one portion of a hinge and a generally-planar front display element which carries the other portion of said hinge, pivotally hinged it to said rear element to engage said ends between said elements, and including a mounting fixture having a tubular bore carried by said front element adapted to retain and display, when attached thereto, a separately usable ornament.

5,023,979

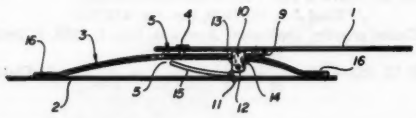
FASTENER FOR GARMENTS

Robert B. Bennett, 352 E. Linden, Englewood, N.J. 07631; Vincent Hung, 65 Fairfield Rd., Parsippany, N.J. 07054, and Ezra Sassoon, One Stanley Rd., White Plains, N.Y. 10605

Filed Dec. 6, 1989, Ser. No. 446,869

Int. Cl.[5] A44B *11/00*

U.S. Cl. 24—68 R **10 Claims**



1. A hidden clasp fastener for a pair of overlapping members having an underlying member and an outer overlying member comprising:

a longitudinally-extending cloth tab secured at both free ends thereof to one of said overlapping members;

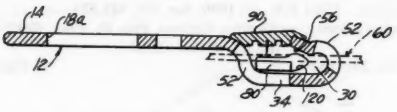
a closure clasp having a bottom, a pair of pivot arms projecting from said bottom and a closure clasp arm pivotally mounted between said pivot arms, said closure clasp bottom secured to the other of said overlapping members so that the closure clasp is hidden between the two overlapping members, wherein the cloth tab passes through the closure clasp between the bottom of said clasp and the closure clasp arm and the closure clasp is longitudinally shiftable along the cloth tab when the closure clasp arm is in an open position and when the closure clap arm is in a closed position the closure clasp arm securably engages the cloth tab against the bottom of said clasp preventing longitudinal shifting of the closure clasp along the cloth tab.

5,023,980

FREE RUNNING CINCHING LATCH PLATE

Rudy V. Thomas, Sterling Heights, Mich., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Aug. 31, 1989, Ser. No. 401,330
Int. Cl.[5] A44B *11/10*
U.S. Cl. 24—196 7 Claims



1. A latch plate assembly comprising:

a plate having a tongue formed at one end thereof and at an opposite end a black portion, the back portion includes an end portion comprising open ends and defining an open recess;

the back portion including radially extending opposing openings through which may be received a substantially flat seat belt webbing;

lock bar means movable between first and second positions for releasing and compressing the webbing;

cap means for enclosing the open recess and open ends including guide means for positioning the lock bar means into compressive engagement with the webbing and for slidably securing the lock bar therein wherein the cap means includes first means for generating a frictional force of engagement with the webbing and a cap plate received in the open recess, opposingly situation inserts adapted to be received within the open ends of the back portion, each insert includes the guide means which compress a respective inwardly facing first recess into which respective ends of the lock bar means is received wherein each first recess includes a tapered surface such that as the lock bar means moves from the first position toward the second position, the lock bar means moves into compressive engagement with the webbing the wherein the webbing as same passes through the back portion is positioned between the cap means and the lock bar means.

5,023,981

BELT BUCKLE WITH INTERLOCKING DUAL TONGUE

James R. Anthony, Carmel; Michael A. Wiseman, Indianapolis, and Allan R. Lortz, Carmel, all of Ind., assignors to Indiana Mills & Manufacturing, Inc., Westfield, Ind.

Filed Jun. 22, 1989, Ser. No. 370,240
Int. Cl.[5] A44B *11/25*
U.S. Cl. 24—573.5 12 Claims

1. A belt buckle-tongue combination comprising:

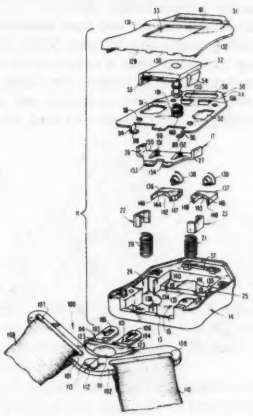
a buckle main body;

tongue means insertable into and releasable lockable with said buckle main body;

a latch positioned in said main body and held captive therein, said latch movable between a latched position with said tongue means and an unlatched position;

a push button slidably mounted to said buckle main body and operable associated with said latch to move said latch back and forth between said latched position and said unlatched position; and,

an indicator slidably mounted to said buckle main body, said indicator being an element separate from said push button and movable independently of said push button, said indicator in contact with said latch and movable to a first indicating position when said latch is in said latched position and to move a second position when said latch is in said unlatched position thereby said indicator readily



reveals when said tongue means is lockingly engaged with said buckle main body.

5,023,982

SHOE LACE FOR ATHLETIC SHOES

Charles T. Mehan, 1949 N. 11th St., Sheboygan, Wis. 53081

Filed Jan. 16, 1990, Ser. No. 465,805
Int. Cl.[5] A43C *9/00*
U.S. Cl. 24—715.3 3 Claims

1. A shoe lace for use in an athletic shoe, said lace being stretchable along its entire length and comprising

a plurality of rubber strands, each of said strands being individually covered by a textile material,

said covered rubber strands being woven into a hollow tubular configuration having a pair of straight planar sections along substantially its entire length with said straight planar sections integrally connected by a pair of curved sections disposed at opposite sides of said straight sections,

plastic tip at each end of the strip to provide a reduced cross-sectional dimension for the lace ends; and

the entire length of the lace is stretchable.

5,023,983

DEVICE FOR PRODUCING MOUNTING BORES OR VALVE BORES IN A WHEEL DISK

Hans-Henning Winkler, Tuttlingen, and Eugen Rütschle, Mühlheim, both of Fed. Rep. of Germany, assignors to Chiron-Werke GmbH & Co. KG, Tuttlingen, Fed. Rep. of Germany

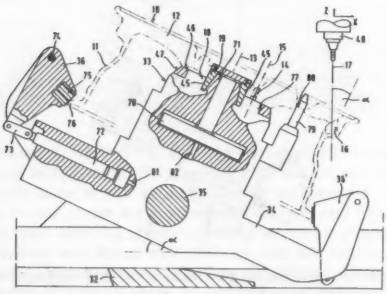
Filed Oct. 11, 1988, Ser. No. 255,904
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1987, 3735858
Int. Cl.[5] B23B *7/00;* B23C *1/14;* B23P *23/00*
U.S. Cl. 29—27 R 15 Claims

1. An apparatus for machining wheel bolt bores and valve bores into a rim of a motor vehicle wheel, said wheel bolt bores extending in a direction essentially parallel to a wheel axis and said valve bores extending in a direction inclined thereto by a predetermined angle, the apparatus comprising:

a base member defining a plane;

a spindle stock means with a machining tool arranged therein said spindle stock means being displaceable along a first and second coordinate direction relative to said base member and parallel to said plane, and along a third coordinate direction perpendicular thereto;

chucking means mounted on said base member for holding said rim during machining of said bores, said chucking means being provided with a reference surface for supporting a reference plane of said rim when held in said chucking means, said reference surface and said reference plane extending radially relative to said wheel axis, said



chucking means including holding means for pressing said rim with said reference plane upon said reference surface, said holding means being pivotable about an axis extending in a parallel direction relative to said pivot axis and operable by means of a first piston-and-cylinder unit to engage said rim at a flange thereof located distant from said reference plane;

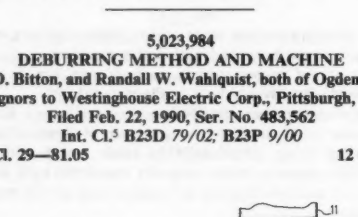
swivel means for pivoting said chucking means about a pivot axis between a first position with said wheel bolt bores extending parallel to said third coordinate direction and into a second position with said valve bores extending parallel to said third coordinate direction.

5,023,984

DEBURRING METHOD AND MACHINE

Max D. Bitton, and Randall W. Wahlquist, both of Ogden, Utah, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 22, 1990, Ser. No. 483,562
Int. Cl.[5] B23D *79/02*; B23P *9/00*
U.S. Cl. 29—81.05 **12 Claims**



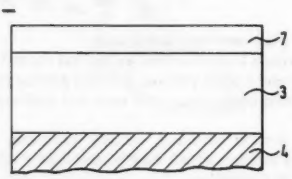
6. A machine for deburring a product of material having burrs after being formed, comprising a substantially horizontal screen mounted for endless movement in a substantially horizontal plane and adapted to have such a product deposited on its upper surface; means for supporting and for moving said screen endlessly; confining wall means and a series of baffles within said confining wall means, both the baffles of said series and said confining wall means being associated with and spaced and supported above said screen so as to confine on said screen a product to be deburred that is deposited on and carried by said screen and so as to cause and guide movement of said product relative to, and back and forth across, said screen as the screen moves and carries the product with it; and means for removing the product from the screen.

5,023,985

COATED ROLL FOR A PAPER MAKING MACHINE

Jukka Salo, and Pentti Lehtonen, both of Jyväskylä, Finland, assignors to Valmet Paper Machinery Inc., Finland

Filed Feb. 20, 1990, Ser. No. 481,881
Claims priority, application Finland, Feb. 28, 1989, 890953
Int. Cl.[5] B21B *31/08*
U.S. Cl. 29—132 **14 Claims**



1. A roll for a pulp machine, paper machine or paper finishing machine comprising:

a roll or cylinder mantle;

a resilient polymer coating which is formed on an outer surface of said mantle, said resilient polymer coating having a thickness within a range of 2 to 35 millimeters; and

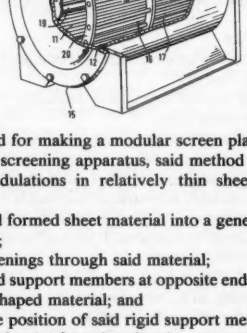
another coating which is formed on an outer surface of said resilient polymer coating of a harder and more wear-resistant material than said resilient polymer coating, another coating having a thickness within a range of 1 to 150 microns.

5,023,986

METHOD OF MANUFACTURING A WAVE SCREEN PLATE

William Gero, Lanesboro, and Frank Paskowski, Pittsfield, both of Mass., assignors to Beloit Corporation, Beloit, Wis.

Division of Ser. No. 206,151, Jun. 10, 1988, Pat. No. 4,954,249.
This application Apr. 17, 1990, Ser. No. 510,332
Int. Cl.[5] B07B *1/18*
U.S. Cl. 29—163.6 **7 Claims**



1. A method for making a modular screen plate for use in a pulp pressure screening apparatus, said method comprising:

forming undulations in relatively thin sheet material by bending;

shaping said formed sheet material into a generally cylindrical shape;

creating openings through said material;

placing rigid support members at opposite ends of said cylindrically shaped material; and

securing the position of said rigid support members relative to each other by fastening therebetween releasable tieing members.

5,023,987

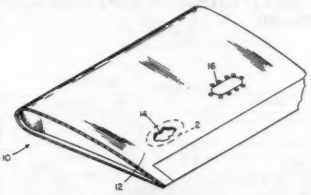
STRATO STREAK FLUSH PATCH

Karl J. Wuepper; Jerald L. Swanson, and Dale E. Hartz, all of King County, Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 401,556, Aug. 28, 1989, abandoned, which is a continuation of Ser. No. 206,566, Jun. 14, 1988, abandoned. This application May 30, 1990, Ser. No. 530,432

Int. Cl.[5] B23P *6/00*

U.S. Cl. 29—402.11 10 Claims



1. A field repair method for forming a structural blind patch in a sheet of anisotropic load-bearing material having a known thickness, comprising the steps of:

providing an anisotropic flush patch having a major axis and a minor axis of substantially different dimensions, a filler portion having a thickness equal to the thickness of the material to be patched, and a circumferential backing lip extending from the perimeter of the filler portion so as to form a circumferential shoulder therewith;

providing a grasping member extending from the filler portion;

trimming a damaged area of the material to be patched to the same shape as that of the filler portion, thereby providing a trimmed area having a major axis and a minor axis;

aligning the major axis of the flush patch with the minor axis of the trimmed area;

inserting the minor axis of the flush patch through the major axis of the trimmed area, thereby inserting the patch through the trimmed area;

aligning the filler portion with the trimmed area after the flush patch has been inserted so that the trimmed area is flushly filled by the filler portion, and so that the circumferential shoulder is closely received by the trimmed area, and so that the backing lip abuts the material adjacent to the trimmed area;

fixing the backing lip to the material while holding the flush patch in place with the grasping member; and

removing the grasping member whereby compressive loads are transferred across the trimmed area through the filler portion and tensile loads are transferred across the trimmed area through the backing lip.

5,023,988

METHOD FOR REMOVING A BOWLING BALL FINGERTIP INSERT FROM A BOWLING BALL FINGER HOLE

Thomas W. Lamond, 1647 S. 27th St., Philadelphia, Pa. 19145

Division of Ser. No. 918,347, Oct. 4, 1986, abandoned. This application Nov. 19, 1990, Ser. No. 617,414

Int. Cl.[5] B23P *19/00*; B26B *3/00*

U.S. Cl. 29—426.1 20 Claims

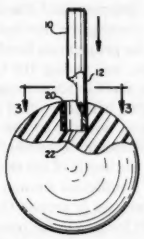
1. A method for removing a bowling ball fingertip insert from a bowling ball finger hole in which said insert is secured by an adhesive joint between said insert and said finger hole, said method comprising the steps of:

providing a tool having:

(a) a handle, and

(b) a grooved blade extending away from said handle and having (i) a pair of sharpened edges extending along the length of said blade merging into a point at the free end of said blade and (ii) an outside diameter equal to the diameter of said bowling ball finger hole;

breaking partially said adhesive joint between said fingertip insert and said bowling ball finger hole by inserting said blade into said finger hole between said insert and said finger hole;



breaking the remainder of said adhesive joint between said fingertip insert and said bowling ball finger hole by turning said tool about its axis while said blade is between said insert and said finger hole;

removing said blade from said bowling ball finger hole; and

removing said fingertip insert intact from said bowling ball finger hole.

5,023,989

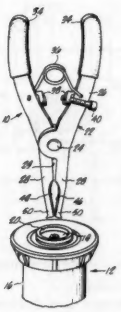
TOOL FOR REPAIRING POP-UP SPRINKLERS

David L. Hargrave, 5036 Walmar Ave., La Canada, Calif. 91011

Filed Nov. 22, 1989, Ser. No. 440,992

Int. Cl.[5] B25B *7/12*

U.S. Cl. 29—426.5 8 Claims



1. A method for adjusting and repairing a pop-up sprinkler having a shaft biased downwardly into a cavity in the sprinkler, the sprinkler shaft comprising an outside wall and a recess having an inside wall, the method comprising the steps of:

(a) selecting a hand tool comprising:

(i) a pair of elongated members pivotally connected to each other at a pivot point to form a pair of opposed elongated handles and a pair of opposed grippers, wherein pivoting the handles together causes the grippers to pivot apart;

(ii) biasing means for biasing the handles apart and the grippers together; and wherein

(iii) each gripper comprises:

a) a tip at its end;

b) an inner surface proximate to the other gripper;

c) an opposed outer surface distal from the other gripper, each outer surface including a nose section distant from the pivot point and sized to fit into the shaft recess when the grippers are together;

d) a projection projecting outwardly from the outer

surface of the tip of the nose section for gripping the inside wall of the sprinkler shaft; and

e) a cut-out portion on the inner surface shaped so that the opposed cut-out portions of the grippers form an opening shaped to firmly grip the outside wall of the extracted sprinkler shaft;

(b) extracting the sprinkler shaft upwardly from the recess by inserting the grippers into the shaft recess with the grippers closed, pressing the handles together to open the grippers so that the projections firmly grip the inside wall of the shaft recess, and pulling the tool upwardly; and

(c) maintaining the shaft in its extracted position with the tool by releasing the handles so that they are biased by the spring into an open position so that the grabbers can be removed from the inside of the shaft recess, then removing the tool from the inside of the shaft recess, pressing the handles together a sufficient amount to open the grabbers so that the grabbers can fit around the sprinkler shaft with the sprinkler shaft located in the opening, and then releasing the handles so that the biasing means biases the grabbers firmly against the extracted shaft.

5,023,990

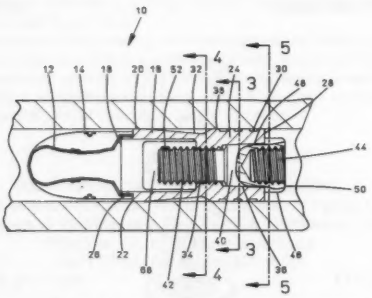
DEVICE AND METHOD FOR REMOVABLY RETAINING COMPONENTS IN A SMOOTH BORE

Leighton Lee, II, Guilford, and Robert J. Kolp, Jr., Ivoryton, both of Conn., assignors to The Lee Company, Westbrook, Conn.

Filed May 5, 1989, Ser. No. 347,736

Int. Cl.[5] F16B *13/06;* **B23P** *11/02*

U.S. Cl. 29—525.1 **21 Claims**



1. The method of removably retaining a component in an installation bore comprising

A. attaching a component to a device comprising an expansion means and body means that comprises a plurality of axially extending bore engaging means each having female screw threads, interior surfaces that are conically curved and axially tapered and exterior surfaces that are cylindrically curved, wherein the expansion means comprises a section formed with male screw threads engageable with the female screw threads of the bore engaging means and a conical, tapered section coaxial with and of slightly greater average diameter than the curved interior section of the bore engaging means, wherein the expansion means is adapted to engage a means for applying rotational torque and to engage a means for retaining and removing said device from the installation bore,

B. inserting the removal means into the torque means,

C. engaging the removal means with the expansion means,

D. inserting the device into the installation bore,

E. engaging the expansion means with the torque means,

F. applying clockwise rotational torque to the torque means,

G. disengaging the removal means of and the torque means from the expansion means, and

H. removing the removal means and the torque means from the installation bore.

5,023,991

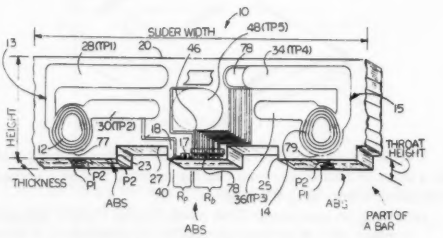
ELECTRICAL GUIDE FOR TIGHT TOLERANCE MACHINING

Alan B. Smith, Lincoln, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Aug. 31, 1988, Ser. No. 238,868

Int. Cl.[5] G11B *5/127;* **B23Q** *17/00, 15/00*

U.S. Cl. 29—603 **20 Claims**



1. In a machining process for machining the surface of a workpiece to a height above a minimum height plane, which workpiece has an electronic machining guide having an analog resistive sensor with a near and far plane relative to and substantially parallel to the machining plane and a discrete resistive sensor having a plurality of contacts each respectively meant to be broken during machining as a calibration event, a method for determining present machining height of said surface during machining with respect to said minimum height plane, comprising the steps of:

(a) determining before machining a constant K which relates the resistance value Rp of said analog sensor to a known height h of said analog sensor, and

(b) determining present machined height z with respect to location of said minimum height plane in view of constant K.

5,023,992

CABLE LOADING MACHINE

Takashi Masaki, Tokyo, Japan, assignor to Hirose Electric Co., Ltd., Tokyo, Japan

Filed Dec. 28, 1990, Ser. No. 611,050

Claims priority, application Japan, Nov. 17, 1989, 1-297712

Int. Cl.[5] B23P *19/00, 21/00*

U.S. Cl. 29—705 **1 Claim**

1. A cable loading machine for connecting a plurality of insulated conductors of a multiconductor cable to terminals of a connector one at a time, which comprises:

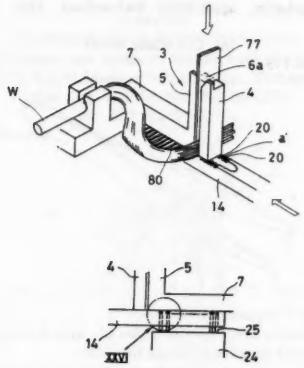
a conductor separation unit having a conductor separation assembly with a gap sufficiently large to receive separated conductors;

a conductor pressure unit for applying a pressure on said conductors in said conductor separation assembly in a direction from an inlet to an outlet;

a conductor separation member having a row of teeth with conductor receiving channels therebetween and laterally movable over said conductor outlet for inserting said conductors pushed out of said outlet into said conductor receiving channels one at a time and positioning said inserted conductors on an outlet side of said conductor receiving channels;

a probe having probing pins for contact with said separated conductors to identify line pairs and line numbers; and

a conductor push up unit for pushing up said conductor from said outlet side of said conductor receiving channels to



said inlet of said conductor separation unit to transfer it to a gripping unit.

5,023,993

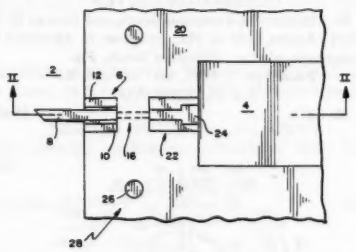
METHOD FOR MANUFACTURING A HIGH-PERFORMANCE PACKAGE FOR MONOLITHIC MICROWAVE INTEGRATED CIRCUITS

Raymond S. Fengelly, Lawrenceville, N.J., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Division of Ser. No. 251,446, Sep. 30, 1988, Pat. No. 4,901,041. This application Dec. 19, 1989, Ser. No. 452,308

Int. Cl.[5] H05K *3/00*

U.S. Cl. 29—843 **3 Claims**



1. A method for manufacturing a monolithic integrated circuit package having a perimeter, comprising the steps of:

(a) printing at least one feedthrough on a first surface of a ceramic substrate having first and second opposed surfaces;

(b) firing the ceramic;

(c) forming a plurality of visa in the ceramic substrate, each said via extending from said first surface to said second surface;

(d) cutting a die cavity in the ceramic for each package to be formed so that each via is located at a point distant from both said die cavity and the perimeter of each said package;

(e) metallizing at least one electrical conductor on the ceramic substrate, each said electrical conductor corresponding to a printed feedthrough;

(f) metallizing the vias; and

(g) brazing a ground plane base to the ceramic substrate on a second surface opposite said first surface.

5,023,994

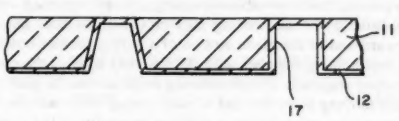
METHOD OF MANUFACTURING A MICROWAVE INTERGRATED CIRCUIT SUBSTRATE INCLUDING METAL LINED VIA HOLES

Marina Bujatti, and Franco N. Sechi, both of Palo Alto, Calif., assignors to Microwave Power, Inc., Santa Clara, Calif.

Filed Sep. 29, 1988, Ser. No. 251,539

Int. Cl.[5] H05K *3/00*

U.S. Cl. 29—852 **4 Claims**



1. The method of forming a substrate for microwave integrated circuits which comprises the steps of:

a) forming in a body of insulating material through holes at preselected locations to extend between the upper and lower surface of said body;

b) providing a removable layer on the upper surface of said body which covers at least the upper end of said holes;

c) depositing a metal layer on the bottom surface of said body, the walls of said holes and the underside of said removable layer; and

d) removing said removable layer to leave an insulating body having a planar upper surface composed of the insulating material and metal layer at said holes.

5,023,995

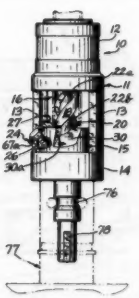
CABLE STRIPPING DEVICE

Steve E. Kaplan, Elyria, Ohio, assignor to Multilink, Inc., Elyria, Ohio

Filed Mar. 5, 1990, Ser. No. 488,119

Int. Cl.[5] B21F *13/00;* **H02G** *1/12*

U.S. Cl. 30—90.1 **23 Claims**



1. In a stripping device which is rotated about an axis relative to a cable to strip an end of the cable, the cable having a center conductor and dielectric between the center conductor and an outside sheath, said device comprising a tool mounting member for separately and removably supporting a sheath severing cutter and a coring tool for coring dielectric material from the end of the cable with the outer sheath telescoping over the coring tool and the center conductor moving in a central passageway through the coring tool as the device is rotated to core dielectric material from the end of a cable with the coring tool comprising a coring blade section having an outside diameter to be received inside the sheath of the cable to core the dielectric of the cable and the coring blade section extending rearwardly from the forward end of the coring tool and terminating at its rearward end in a reduced portion providing a rearwardly extending shank of reduced diameter to be received in the tool mounting member for holding the coring

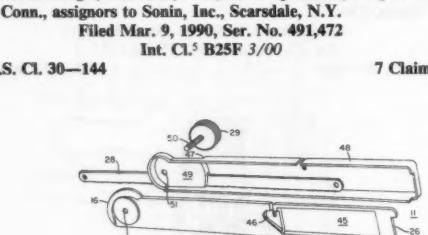
tool in said tool mounting member, said tool mounting member having an axial passageway, approximately the diameter of the tool shank, which opens into the forward end of the tool mounting member for receiving the shank extending from the coring blade section section to support the coring tool along the axis of the device with rearward end of the blade section disposed adjacent the forward end of the tool mounting member and the shank extending inwardly of the tool mounting member from the forward end of said axial passageway, said tool mounting member having cutter mounting means on its forward end for removably mounting a sheath severing cutter independently of said coring tool in a position adjacent the rearward end of the blade section of a coring tool mounted in said tool holding member with the severing edge of the cutter extending angularly at a chamfering angle across the path of a sheath moving from the end of said coring blade section, the severing edge extending to a position inwardly of the outside surface of the coring blade section of the coring tool to sever and chamfer the sheath as the coring action moves the sheath past the cutter.

5,023,996

MULTIPLE BLADE HANDSAW

Robert Pape, Newtown; William Rose, Hartford, both of Conn.; Frank Burgel, Scarsdale, N.Y., and Chip Adams, Deep River, Conn., assignors to Sonin, Inc., Scarsdale, N.Y.

Filed Mar. 9, 1990, Ser. No. 491,472
Int. Cl.[5] B25F *3/00*
U.S. Cl. 30—144 **7 Claims**



1. A combination handsaw comprising:

first blade housing having on an inside face thereof a longitudinal slot for supporting a first blade for movement along a longitudinal axis of said blade housing so that said blade may be moved from a retracted position within said housing to an extended position, whereby a major portion of said blade extends through one end of said housing;

a second blade housing supporting a second blade for longitudinal movement through one end of said second blade housing to an extended position, whereby a major portion of said blade extends outside one end of said housing; and

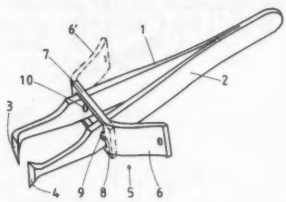
pivot support for connecting first ends of said housings together, permitting opening of said housings from a coextensive closed position in facing relationship to an open position with spaced apart second ends.

5,023,997

PAIR OF NIPPERS

Jean-Francois Salvi, Vesenaz, Switzerland, assignor to Sipel Electronics S.A., Vesenaz, Switzerland

Filed Dec. 4, 1989, Ser. No. 445,435
Claims priority, application Switzerland, Dec. 7, 1988, 4532/88
Int. Cl.[5] B26B *12/00*
U.S. Cl. 30—175 **6 Claims**



1. A pair of nippers, comprising:

a first flexible arm, a second flexible arm having one end connected to an end of said first arm;

an auxiliary actuating lever having first and second portions with a bend therebetween, said first portion having a cutout and being oriented transversely to the lengthwise dimension of said arms, each of said flexible arms extending through said cutout, a second portion of said actuating lever being subject to application of a force that pivots said lever relative to said first arm, the unconnected ends of said arms moving toward each other when said lever pivots by action of said lever on said second arm;

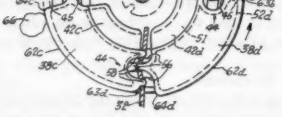
means for pivotably engaging said lever with said first flexible arm at an intermediate point along the length of said arm.

5,023,998

FILAMENT HOLDER FOR A ROTATING FILAMENT VEGETATION CUTTER

Andrew M. Masciarella, Pompano Beach, and George R. Whistler, Fort Meyers, both of Fla., assignors to Advanced Products International, Inc., Pompano Beach, Fla.

Filed Apr. 7, 1989, Ser. No. 335,055
Int. Cl.[5] B26B *7/00*
U.S. Cl. 30—276 **25 Claims**



1. A filament holder for a vegetation cutter of a type coupled to rotating means for rotating said holder and at least one filament extending therefrom at a rotational speed sufficient to permit said rotating filament to cut said vegetation, said holder comprising:

a disk shaped member having a center and further having means for holding one portion of a filament while at least one other portion of said filament extends from at least one opening in the periphery of said member, each opening having first and second peripheral edges extending by respective first and second differing distances from the

center of said member, the distance from the periphery of said member to the center of said member not decreasing from said first peripheral edge to the next adjacent second peripheral edge along the periphery of said member.

5,023,999

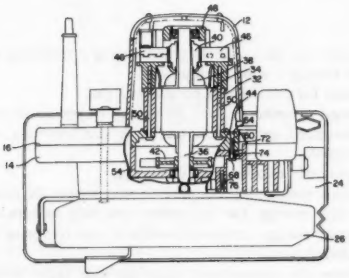
UNITIZED TOOL CONSTRUCTION

Timothy J. Looper, and James R. Sistare, both of Pickens, S.C., assignors to Ryobi Motor Products Corp., Pickens, S.C.

Filed Aug. 9, 1990, Ser. No. 565,251

Int. Cl.[5] B23D *45/16*

U.S. Cl. 30—390 **9 Claims**



5. A power tool comprising:

a motor assembly including a field subassembly, an armature subassembly including an armature shaft, a fan mounted on one end of said armature shaft, a bearing support member holding the other end of said armature shaft, a fan shroud, and motor assembly securing means for securing said bearing support member to one end of said field subassembly and said fan shroud to the other end of said field subassembly;

a two part housing; and

means for securing each part of the two part housing to the fan shroud from a different respective side thereof.

5,024,000

MATERIAL-REMOVAL WOODWORKING TOOL

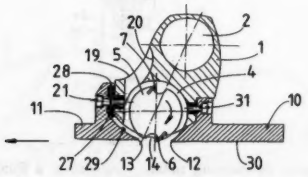
André Casal, 84 B rue Ancienne, 1227 Carouge/Geneva, Switzerland

Filed Mar. 15, 1990, Ser. No. 493,976

Claims priority, application Switzerland, Mar. 21, 1989, 1043/89

Int. Cl.[5] B27C *1/10*

U.S. Cl. 30—475 **14 Claims**



1. A material removal woodworking tool comprised of:

a) a body having an opening on its underside;

b) an electric motor;

c) a rotor driven by the motor, the rotor having an axis of rotation, the rotor being provided with means for removing material, the means projecting through the opening on the underside of the body;

d) two removable guide pieces, the guide pieces being arranged so that an edge of each of the guide pieces are parallel and opposite each other, thereby defining the opening, with at least one of the guide pieces being provided with adjustment means to permit adjustability;

e) gripping means attached to the body and extending on either side of the body forming an axis parallel to the axis of rotation of the rotor, the axis formed by the gripping means lying within the planar area formed by the outer dimensions of the rotor.

5,024,001

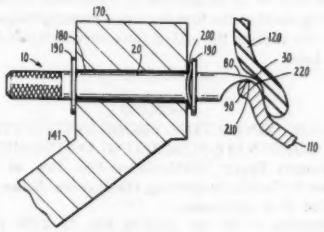
WHEEL ALIGNMENT RIM CLAMP CLAW

Willy Borner, Cupertino, and Kenneth A. McQueeney, Los Gatos, both of Calif., assignors to Balco, Incorporated, San Jose, Calif.

Filed Oct. 7, 1988, Ser. No. 255,116

Int. Cl.[5] G01B *21/26*

U.S. Cl. 33—203.18 **7 Claims**



1. A claw for use in a wheel alignment rim clamp and capable of engaging the outer rim of a tire-carrying wheel said claw including a cylindrical arcing claw body for rotatable mounting in the rim clamp with the axis of the body being perpendicular to the plane defined by the outer rim of the wheel and terminating in a rim-engaging inwardly continuously curving arcing bladelike tip the inward curve of the arcing tip defining a rim clearing relieved region in the body with the cross sectional thickness of the body in the tip and relieved region being small enough for the tip to fit between the rim and the tire.

5,024,002

APPARATUS WITH A SUPPORTING FRAME AND PROCESS FOR MANUFACTURING SUCH A FRAME

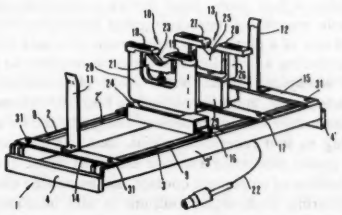
Mario Possati, Bologna, Italy, assignor to MARPOSS Societa' per Azioni, S. Marino di Bentivoglio, Italy

Division of Ser. No. 423,740, Oct. 19, 1989, abandoned, which is a continuation of Ser. No. 191,536, May 9, 1988, abandoned. This application Jul. 19, 1990, Ser. No. 554,168

Claims priority, application Italy, Jun. 16, 1987, 3521 A/87; Nov. 9, 1987, 3683 A/87

Int. Cl.[5] G01B *5/20*

U.S. Cl. 33—549 **13 Claims**



1. A gauge for checking linear dimensions of pieces with rotational symmetry, comprising positioning means for positioning the piece to be checked; gauging heads for checking linear dimensions of the piece support means for carrying out the positioning means and the gauging heads, the support means comprising a support base that defines two longitudinal

parallel guides and intermediate support means with at least two transversal members longitudinally adjustable with respect to the support base; and fastening means with at least two pairs of rapid fastening devices, for clamping the transversal members to the support base, wherein said support base comprises two pairs of longitudinal parallel bars and two transversal bars welded to the longitudinal bars for locally connecting them to one another, the longitudinal bars and the transversal bars having substantially rectangular cross-sections, each guide being defined by the associated bars of one of the two pairs and by the through space between these two bars, each rapid fastening device comprising a through element passing through the through space of an associated guide, a first limit stop element associated to an end of the through element and adapted for cooperating with the two bars of the associated pair of bars and a second limit stop element coupled in a movable way to the other end of the through element for cooperating with an end of an associated transversal member, in a position opposed to the first limit stop element with respect to the bars, for locking the end of the transversal member to the support base.

5,024,003

WORK-CONTACTING PROBE SYSTEM FOR A COORDINATE-MEASURING INSTRUMENT

Karl-Hermann Breyer, Heidenheim, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim/Brenz, Oberkochen, Fed. Rep. of Germany

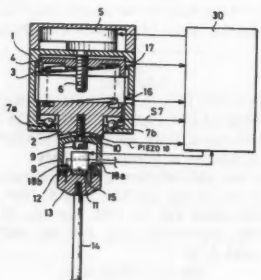
Continuation of Ser. No. 234,510, Aug. 22, 1988, Pat. No. 4,916,825. This application Apr. 5, 1990, Ser. No. 505,905

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1987, 3728578

The portion of the term of this patent subsequent to Apr. 17, 2007, has been disclaimed.

Int. Cl.[5] G01B *7/28*

U.S. Cl. 33—561 **11 Claims**



1. A probe system for a coordinate-measuring instrument, comprising a first probe head having a movable part with receptacle means for interchangeable accommodation of a selected one of a plurality of rigid probe pins, said first probe head producing a first electrical signal in response to a condition of workpiece contact via a probe pin mounted to said receptacle means, and a second probe head for optional use in said system, said second probe head being adapted for selective mounting to said receptacle means, said second probe head having means producing a second electrical signal in response to a condition of workpiece contact, and associated electronics for delivering probe-signal outputs to said instrument, said electronics including switching means operative (a) in a first mode to deliver said first electrical signal as its work-contact output as long as said receptacle means accommodates a rigid probe pin, and (b) in a second mode to deliver said second electrical signal as its work-contact output as long as said receptacle means accommodates said second probe head.

5,024,004

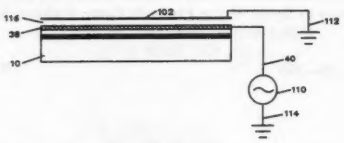
RADIO FREQUENCY AIR FLOAT BAR

Hugh D. Jaeger, Deephaven, Minn., assignor to W.R. Grace & Co.-Conn., New York, N.Y.

Filed Mar. 7, 1990, Ser. No. 490,063

Int. Cl.[5] B01K *5/00*

U.S. Cl. 34—1 **8 Claims**



1. An air bar for supporting and curing a traveling web of material having a width comprising:

a. means for providing a pressurized gas;

b. means coupled to said providing means to direct said pressurized gas into contact with said traveling web of material;

c. source of radio frequency energy;

d. means responsibly coupled to said source of radio frequency energy for uniformly coupling said radio frequency energy across said width of said traveling web of material; and,

e. means for capacitively coupling said radio frequency energy to said traveling web of material.

5,024,005

DEWATERING MEANS

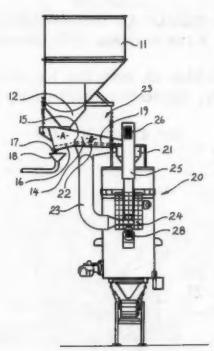
Peter J. Stewart, Maddington, Australia, assignor to Seaford Nominees Pty Ltd., Australia

Filed Nov. 22, 1989, Ser. No. 440,225

Claims priority, application Australia, Nov. 23, 1988, PJ1603

Int. Cl.[5] F26B *9/00*

U.S. Cl. 34—164 **8 Claims**



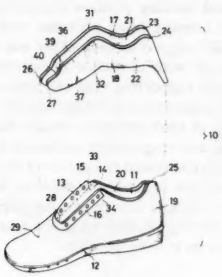
1. A pulp dewatering means comprising a fluid bed, said fluid bed comprising a delivery zone for receipt of said pulp from a hopper and a drying zone, said delivery zone being separated from said drying zone by a weir and said delivery zone having a porous floor associated with a drain, said drying zone comprising a vibrating surface downwardly inclined from said weir, the lower end of said drying zone depositing particulate material at a delivery outlet, said porous surface being associated with a plenum chamber below said porous surface, said plenum chamber being connected to a source of hot gaseous fluid.

5,024,006

ATHLETIC SHOE

Junichi Kiyosawa, Kobe, Japan, assignor to Asics Corporation, Hyogo, Japan

Filed Oct. 27, 1989, Ser. No. 427,565
Claims priority, application Japan, Jan. 26, 1989, 1-8061[U]
Int. Cl.[5] A43B *23/26*
U.S. Cl. 36—83 **19 Claims**



1. An athletic shoe comprising:

a sole;

an upper body disposed on said sole and having a throat opening for insertion of a foot;

said upper body including a vamp portion having a U-shaped forward opening elongated from said throat opening and defined by a pair of opposed side rims and a bottom rim; and

first and second tongue pieces which collectively cover said U-shaped forward opening from said bottom rim to said throat opening, wherein

(i) said first shoe tongue piece is secured to said vamp portion and is disposed along one of said pair of opposed side rims for covering a part of said U-shaped forward opening; and

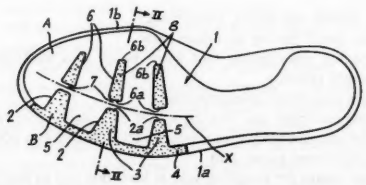
(ii) said second shoe tongue piece is secured to said vamp portion and is disposed along another one of said pair of opposed side rims for covering a remaining part of said U-shaped forward opening.

5,024,007

SOLE FOR A SPORT SHOE

Pierre DuFour, Menthon-St-Bernard, France, assignor to Salomon S. A., Chavanod, France

Filed Apr. 25, 1990, Ser. No. 514,435
Claims priority, application France, Apr. 25, 1989, 89 05475
Int. Cl.[5] A43B *3/00, 13/14*
U.S. Cl. 36—127 **19 Claims**



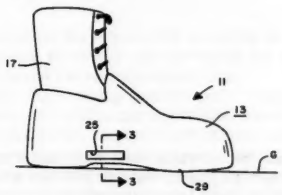
1. Walking sole for a sport shoe, especially a golf shoe, comprising a principal element made of a relatively stiff, molded plastic material and which has, in the front portion of at least one of its lateral edges (**1***a*) extending along the front area of the sole on which the front part of the wearer's foot gains support, a succession of substantially transverse spaced notches (**2**) which open into the edge (**1***a*) of the sole, and extend toward the central part of the latter, these notches (**2**) being filled with a material (B) whose degree of elasticity exceeds that of the material (A) composing the main part of the sole, and which forms individual elastic filling elements (**3**) lodged in the respective notches (**2**) delimiting between each pair at least one tongue (**5**) which is transversely flexible around a line (X) located in proximity to the inner ends (**2***a*) of the notches (**2**), wherein said sole has at least one opening elongated substantially transversely (**6**) associated with at least one of its notches (**2**), this opening being aligned with this notch (**2**) in the lateral edge (**1***a*) and at a distance from it, and an element made of an elastic material (**8**) which fills the elongated opening (**6**).

5,024,008

FOOTWEAR DEVICE FOR HUNTERS

D. Ray Maples, 3603 Chester La., Memphis, Tenn. 38119

Filed May 29, 1990, Ser. No. 529,279
Int. Cl.[5] A43B *23/24, 5/18, 7/12, 1/10*
U.S. Cl. 36—136 **7 Claims**



1. A footwear device for use by hunters comprising, in combination:

a) rubber overshoe means for removably wearing over a boot worn by a hunter with the sole of the boot being covered by said overshoe means whereby the boot will not come in contact with the ground as the hunter walks;

b) scent source means for dispensing animal attracting scent onto the ground as the hunter walks, said scent source means being attached to said overshoe means and removable with said overshoe means from the boot; and,

c) means isolating said scent source means from the boot whereby when said overshoe means with said scent source means is removed from the boot, the boot can be worn without emitting the animal attracting scent therefrom;

said overshoe means including a pocket formed therein, said pocket including a cavity for receiving said scent source means and a mouth establishing an entrance to said cavity from the outside of said overshoe means through which said scent means may be moved from and to said cavity, a bottom portion of said overshoe for contacting the ground as the hunter walks, and at least one slot extending from said cavity and through said bottom portion of said overshoe means through which scent from said scent source means may be emitted to the ground when said overshoe means is disposed on said boot.

5,024,009

APPARATUS AND METHOD FOR COLLECTING SHELLFISH AND THE LIKE

Kenneth G. Kirkman, 217 Heintzleman, Anchorage, Ak. 99503

Filed Dec. 5, 1989, Ser. No. 446,139
Int. Cl.[5] E02F *5/00;* **A01K** *75/00*
U.S. Cl. 37—55 **13 Claims**

1. An apparatus for collecting shellfish and the like comprising:

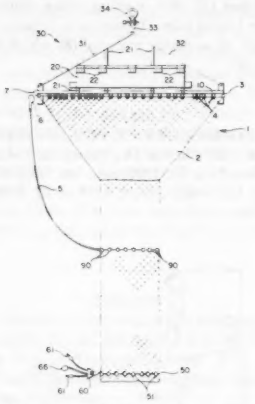
(a) a rectangular frame having a length greater than its width and being open in the center of the frame;

(b) a lightweight net having a first end and a second end and a center, said first end being attached to said frame and extending outwardly therefrom and perpendicularly thereto such that said frame creates a structure to hold the

net open to allow shellfish to be collected therein, said second end being fitted with a release means;

(c) tine means removably connected to said frame and extending downwardly therefrom;

(d) adjustable weighting means, being constructed of lightweight material, attached to said frame to provide a large



downward force on said frame when said frame is being dragged along a scallop bed, but provides no such force when the net is not being dragged;

(e) yoke means, rotatably attached to said frame means to allow the apparatus to be pulled; and

(f) pulling means to pull said apparatus along the sea bottom.

5,024,010

DEVICE IN A QUICK COUPLING

Fritiof Huldén, Molkom, Sweden, assignor to Svets- & Maskinprodukter i Lidkoping AB, Lidkoping, Sweden

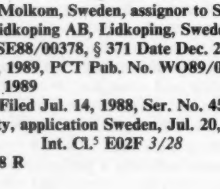
PCT No. PCT/SE88/00378, § 371 Date Dec. 29, 1989, § 102(e) Date Dec. 29, 1989, PCT Pub. No. WO89/00632, PCT Pub. Date Jan. 26, 1989

PCT Filed Jul. 14, 1988, Ser. No. 457,686

Claims priority, application Sweden, Jul. 20, 1987, 8702910

Int. Cl.[5] E02F *3/28*

U.S. Cl. 37—118 R **6 Claims**



1. A device in a quick coupling for detachably coupling a working implement to the operating arm of an excavating machine, said quick coupling comprising two parallel link arms supported by said operating arm, each link arm having an abutment portion with a support surface, and a locking means comprising a stationary wedge support attached to said working implement with an engagement surface facing the working implement and a movable tension pin displaceable by a power cylinder and having an engagement surface for wedging cooperation with the engagement surface of the wedge support, said locking means having support surfaces to engage by means of pressure the support surfaces of the link arms, and comprising a locking unit supported by said link arms, said locking unit having a rigid housing extending between the link arms, in which the tension pin is axially displaceable by said power cylinder between an outer free position clear of said wedge support and an inner locking position engaged with said wedge support, said housing having an opening located at a central portion thereof and disposed vertically in line with said wedge support of the working implement for receipt of the wedge support therein when the tension pin is in its free position, said tension pin in said locking position transverses said central portion, and said housing being provided with opposite supporting pins axially aligned to each other and arranged to be removably received with clearance in opposite openings in said link arms, said supporting pins and openings being provided with said pressure-cooperating support surfaces, said tension pin being of such sufficient length that its front end portion located at said engagement surface in locking position of the tension pin is positioned in a cavity of the housing and as a support surface for pressure-cooperation with a support surface in the cavity, and one of said supporting pins being provided with a through-hole to receive a rear end portion of said tension pin in its locking position.

5,024,011

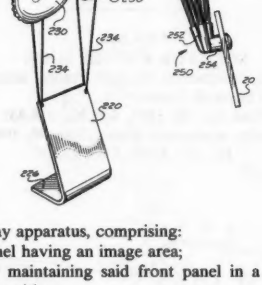
DECORATIVE MESSAGE DISPLAY

Dane H. Collins, 2650 East South Fork Drive, Phoenix, Arizona 85044

Continuation-in-part of Ser. No. 202,325, Jun. 6, 1988, Pat. No. 4,879,823. This application Nov. 13, 1989, Ser. No. 435,626

Int. Cl.[5] G09F *1/00*

U.S. Cl. 40—124.1 **3 Claims**



1. A display apparatus, comprising:

a front panel having an image area;

a base for maintaining said front panel in a substantially upright position;

at least one decorative appendage;

at least one rigid rod having a first end coupled to said at least one decorative appendage and a second end coupled to said front panel; and

holder means for coupling said at least one rod to said front panel, said holder means including

at least one tube having an inner diameter approximately equal to the diameter of said at least one rod, said tube having a longitudinal axis;

a stem secured to said tube, said stem having a longitudinal axis extending in a substantially perpendicular direction with respect to the longitudinal axis of said tube; and

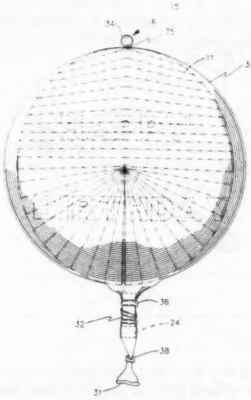
an opening formed in said front panel for receiving said stem.

5,024,012

EXPANDABLE BALLOON WRAPPED MEDIA DISPLAY SYSTEM

Craig J. Lovik, 8565 Custer School Rd., Custer, Wash. 98240

Filed Mar. 20, 1989, Ser. No. 325,882
Int. Cl.[5] G09F *21/06, 1/06, 1/12*
U.S. Cl. 40—212 21 Claims



1. A media display device adapted to be inserted into, and secured to opposite polar extremities of, an uninflated conventional transparent balloon, said media display device comprising, in combination:

a) a media display element comprising at least one sheet of flexible foldable material capable of bearing thereon visually observable media in the form of a printed message, a picture, a graphic design, a graphic display, and combinations of the foregoing, said at least one sheet of flexible foldable material being folded in opposite directions along parallel fold lines into a lineally oriented, accordion pleated configuration having first and second exposed opposite edges;

b) first attachment means secured to said first exposed opposite edge of said at least one accordion pleated sheet;

c) second attachment means having a tubular portion and a generally axially extending flange, said flange being fixedly secured to said second exposed opposite edge of said at least one accordion pleated sheet; and,

d) said at least one lineally oriented accordion pleated sheet being folded upon itself at its midpoint so as to orient the left and right halves of the folded portions of said accordion pleated sheet in essentially parallel, slightly diverging, coaxial relation with said first attachment means projecting axially from one end of said at least one folded over accordion pleated sheet and said second attachment means projecting axially from the opposite end of said at least one folded over accordion pleated sheet;

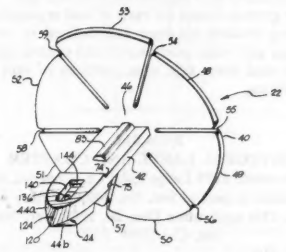
whereby, when said media display element is inserted axially into the interior of a conventional inflated transparent balloon through the inflation aperture and constricted neck portion thereof, said axially projecting portion of said first attachment means can be fixedly secured to the inner surface of the balloon sidewall at a polar location remote from the balloon's inflation aperture and said tubular portion of said second attachment means can be fixedly secured to the inner surface of the balloon's constricted neck portion, whereupon inflation of the balloon causes the balloon sidewall to stretch and enlarge, thereby gradually unfolding and exposing said accordion pleated media display element so as to gradually expose the visually observable media formed thereon to observers through the balloon's transparent sidewall.

5,024,013

IDENTIFICATION TAG ASSEMBLY

Norman J. Hayes, Cody, Wyo., and Raymond B. Avedon, Boulder, Colo., assignors to Identification Technology Corporation, Longmont, Colo.

Filed Nov. 30, 1988, Ser. No. 277,886
Int. Cl.[5] G09F *3/00*
U.S. Cl. 40—301 22 Claims



1. An animal ear tag assembly for mounting on the ear of a domestic animal to identify and distinguish the animal from other animals and the assembly comprising:

a one-piece tag retaining member made of molded plastic material, with a generally transversely extending central slot means therein, adapted to be located on one side of the animal ear in a substantially vertical attitude opposite a generally horizontally extending slit in the animal ear;

an one-piece identification member made of flexible plastic material and comprising:

an enlarged identification portion adapted to be located on the other side of the animal ear, in generally vertically extending parallel relationship thereto;

an elongated strap portion connected to a central core portion of said identification portion and having a longitudinal axis extending transversely away from said identification portion and having a non-circular cross-sectional configuration and size and shape adapted to enable resilient flexible displacement relative to the identification portion and to extend through the generally horizontally extending slit in the animal ear and the generally horizontally extending central slot means in said one-piece tag retaining member;

an enlarged head portion connected to said strap portion and having a larger cross-sectional size and shape than said strap portion and adapted to be inserted through said slit and said central slot means and located in abutting engagement with a generally vertically extending portion of said one-piece tag retaining member;

said identification portion being separated into a plurality of separately flexible movable segmental portions by a plurality of slot means which are located radially outwardly of said central core portion and extend generally radially outwardly relative to said central longitudinal axis of said strap portion from said central core portion to the outer periphery of said identification portion and are located in circumferentially spaced relationship to one another;

said identification member having a central core portion located between said segmental portions and said strap portion;

each of said segmental portions comprising:

a curved radially outermost edge portion, a pair of circumferentially spaced radially extending straight edge portions, and a straight radially innermost edge portion extending between said radially extending edge portions; said central core portion comprising:

a plurality of straight outer peripheral edge portions which are inclined relative to one another and con-

nected to one another by intermediate connecting portions;

said radially extending slot means being radially aligned with said intermediate connection portions;

said central core portion having a polygonal peripheral configuration providing a plurality of straight side edge portions equal in number to the number of segmental portions and located opposite and in spaced parallel relationship to said straight inner side edge portions of said segmental portions; and

hinge groove means for each of said segmental portions being located between and defined in part by said outer side edge portions of said central core portion and said inner side edge portions of said segmental portions.

5,024,014

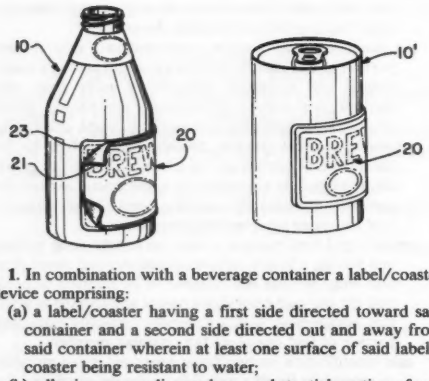
INTEGRAL LABEL AND COASTER

Remi D. Swierczek, 6399 Ledge Lake Ct., Concord, Ohio 44077

Continuation-in-part of Ser. No. 349,051, May 8, 1989, abandoned. This application Dec. 20, 1989, Ser. No. 453,250

Int. Cl.[5] G09F *3/00*

U.S. Cl. 40—310 **12 Claims**



1. In combination with a beverage container a label/coaster device comprising:

(a) a label/coaster having a first side directed toward said container and a second side directed out and away from said container wherein at least one surface of said label/coaster being resistant to water;

(b) adhesive means disposed on a substantial portion of said first side of said label/coaster for removably securing said label/coaster to said beverage container, said adhesive means providing for easy removal of said label/coaster without damage to said label/coaster; and

(c) said label/coaster having printed matter on at least said second side thereof.

5,024,015

LIGHTWEIGHT ARTICULATED ADVERTISING DISPLAY

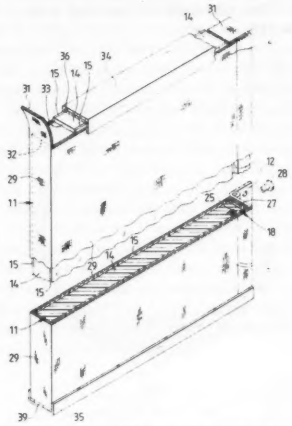
William B. Quarles, Jr., 1133 Dearing Down Dr., Helena, Ala. 35080

Filed Jan. 16, 1990, Ser. No. 465,393

Int. Cl.[5] G09F *7/00*

U.S. Cl. 40—605 **20 Claims**

1. A display for advertisement comprising a plurality of lightweight panels pivotally secured to one another by a plurality of hinges mounted intermediate a plurality of channel members which co-extend and receive therein a lateral marginal edge of one of said plurality of panels, wherein said channel member comprises a base, two sides connected in



perpendicular relation to said base and a clasping edge connected to either of said sides in perpendicular extension therefrom, said clasping edge being securably engaged within a clasping groove located in an adjacent face of said panel.

5,024,016

SELF-LOADING PISTOLS

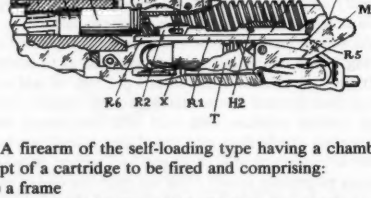
David E. Smith, Ramsey, Isle of Man, assignor to Victory Arms Co., Limited, London, England

Continuation-in-part of Ser. No. 274,203, Nov. 21, 1988, abandoned. This application Oct. 27, 1989, Ser. No. 428,224

Claims priority, application United Kingdom, Dec. 1, 1987, 8728052

Int. Cl.[5] F41A *15/10*

U.S. Cl. 42—25 **6 Claims**



1. A firearm of the self-loading type having a chamber for receipt of a cartridge to be fired and comprising:

(a) a frame

(b) a reciprocating breech block slide mounted for reciprocating movement in the frame between a forward battery position and a retracted position, said breech block slide having an undersurface and including means defining longitudinally extending slot, said breech block slide comprising a detachable breech insert in which said slot is provided;

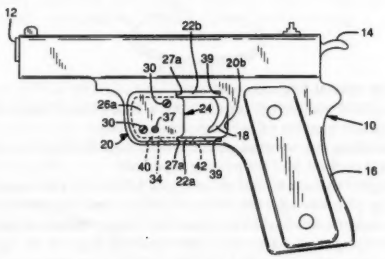
(c) a cartridge extractor and a firing pin carried by the breech block slide;

(d) a floating under rib having a projection received within said slot, the longitudinal extend of said projection being less than the longitudinal extent of said slot whereby said floating rib is longitudinally movable between a forward position and a rearward position relative to the breech block slide, said floating rib having a forward end which

in the forward position of the rib projects beyond the undersurface of the breech block slide to underlie the lower edge of the rear of a cartridge in said chamber when said breech block slide is in its forward battery position, said floating rib forward end cooperating with said lower edge of the rear of the cartridge during initial retraction of the breech block to support the cartridge in order that the cartridge may properly be engaged by the extractor during extraction thereof; and

(e) a cockable hammer, means being provided for forcing the floating rib forwardly in said slot by the action of cocking the hammer.

5,024,017
TRIGGER COVER
Jim Z. Nishioka, 1268 Hemlock NW, Salem, Oreg. 97304
Filed Jul. 20, 1990, Ser. No. 555,837
Int. Cl.[5] F41A *17/54*
U.S. Cl. 42—70.07 **15 Claims**



1. In combination, a gun and a trigger cover, said gun having a trigger, a trigger guard and an elongated barrel extending longitudinally in a shooting direction of the gun, said trigger cover for covering said trigger,

said trigger cover including an open position and a closed position, said open position being a position of said trigger cover for exposing said trigger and allowing access to and operation of the latter, said closed position being a position of said trigger cover for covering and restricting access to said trigger,

said combination also including connecting means for slidably connecting said trigger cover to said gun,

said connecting means, when said trigger cover is in said closed position, positioning said trigger cover to cover and to restrict access to said trigger,

said connecting means, when said trigger cover is in said open position, positioning said trigger cover to allow access to said trigger,

said connecting means allowing said trigger cover to slide forwardly from said closed position to said open position,

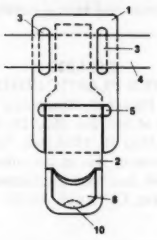
said trigger cover, in said open position, being positioned forwardly of said trigger.

5,024,018
ADJUSTABLE BELT-ATTACHED FISHING ROD HOLDER
Michael R. Ferrigno, 96 Stratford Rd., Tinton Falls, N.J. 07724
Filed Apr. 19, 1990, Ser. No. 511,017
Int. Cl.[5] A01K *97/10*
U.S. Cl. 43—21.2 **3 Claims**

1. A two-piece adjustable belt-attached fishing rod holder comprising:

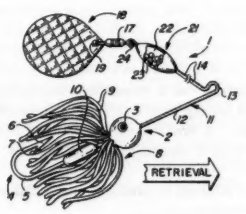
an upper portion having a front and a back with an integral belt-attaching means and an integral horizontally-oriented slot located in the lower central region of said upper portion, with one side of a hook and barb fastener centrally located on the back above the horizontal slot and between the belt-attaching means; and

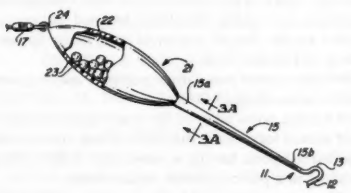
a lower rod support flap having a front and a back with the front of the flap having an integral upwardly-opening and outwardly-extending cup located at the lower area of said flap to serve as a means for receiving and securing the butt end of the fishing rod and also having the complementary side of the hook and barb fastener located along the upper central portion of the front of said flap;



wherein the lower rod support flap is threaded through the integral horizontal slot in the upper portion such that the flap threads from the front to the back of the upper portion, the two sides of the hook and barb fastener being mated together on the back of the upper flap thus providing adjustability.

5,024,019
SPINNER BAIT LURE WITH RATTLE POD
Mark H. Rust, 2721 Frostwood, Shreveport, La. 71108, and Brian J. Kramer, 1815 Lake St., Bossier City, La. 71112
Filed Jun. 19, 1989, Ser. No. 369,034
Int. Cl.[5] A01K *85/00*
U.S. Cl. 43—42.31 **4 Claims**





4. A spinner bait lure comprising a shaped lure body; a hook having a shank portion embedded in said lure body, said shank portion projecting from said lure body in curved relationship to define a sharp hook tip; a skirt attached to said lure body in close proximity to said hook; a substantially rigid, L-shaped harness having one end carried by said lure body and the opposite spinner end adapted to receive at least one spinner; a line eye provided in said harness intermediate said one end and said spinner end, with that portion of said harness which is located between said line eye and said lure body defining a body segment of said harness; and that portion of said harness which extends from said line eye in angular relationship with respect to said body segment to said spinner end defining a

spinner segment, said spinner segment tapered from a first diameter at the spinner end thereof to a smaller second diameter at said line eye; and a rattle pod rigidly carried by said spinner segment of said harness, said rattle pod having a pod cavity and at least one shot located in said pod cavity for emitting said rattling noise, whereby retrieval of said spinner bait lure through a water body causes said spinner to rotate and said rattle pod to vibrate and emit a rattling noise.

5,024,020

SUPER SETTER PLASTIC FISHING HOOK

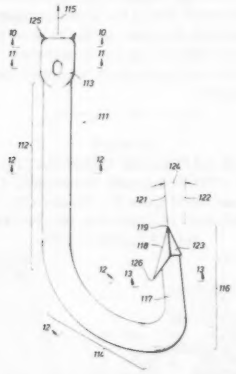
Gary L. Sitton, 6025 Pinkstaff, Beaumont, Tex. 77006

Continuation-in-part of Ser. No. 483,719, Apr. 11, 1983. This application May 18, 1984, Ser. No. 611,742

The portion of the term of this patent subsequent to May 30, 2006, has been disclaimed.

Int. Cl.[5] A01K *83/00*

U.S. Cl. 43—43.16 **1 Claim**



1. A fishing hook formed as a monolithic molded plastic member for supporting fishing bait, said hook comprising:

(a) an elongated body of uniform cross-sectional area and having a line of action extending longitudinally therethrough;

(b) a connection part adapted to connect with a fishing line at one end of said body;

(c) one or more spurs mounted on said connection part extending outwardly therefrom inclined obliquely with respect to the line of action of said body for securing fishing bait to the hook;

(d) a looping curved part forming reverse curve connecting said body to a barbed point;

(e) said barbed point adapted for penetration of an encountered animal form in the direction of said connection part;

(f) said barbed point having a penetration axis residing substantially in a plane common to said body;

(g) said looping curved part having a cross-sectional area not greater than said body;

(h) said cross-sectional areas of said body and said looping curved part adjusted in relative beam-strength whereby the total line pulling force required to straighten out said looping curved part and release said barbed point from an engaged object such as an animal form is approximately 95% of the tensite strength of the fishing line secured to said connection part and whereby said penetration axis of said barbed point is deflective outwardly past parallel with said line-of-action when the line pulling force at said connection part approaches a predetermined level less than that required to straighten out said looping curved part and release said barbed point from an engaged object.

5,024,021

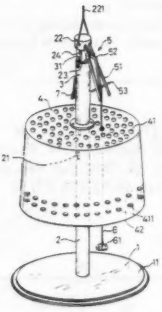
LAMPSHADE-SHAPED ANIMAL TRAP

Chin-Teh Wang, P.O. Box 10160, Taipei, Taiwan

Filed Apr. 4, 1990, Ser. No. 503,912

Int. Cl.[5] A01M *23/02*

U.S. Cl. 43—62 **5 Claims**



1. An animal trap comprising:

a vertical supporting pipe having a base plate formed on a bottom portion of said supporting pipe;

a catching cup secured with an outer pipe thereon movably jacketed on said supporting pipe; and

a trigger means formed on an upper portion of said supporting pipe having a bait rope of which a bait is mounted on a lower end of said bait rope, said trigger means normally hanging said outer pipe said catching cup on an upper portion of said supporting pipe, said trigger means including: a pair of fixed levers inclinedly secured to an upper portion of said supporting pipe, a biasing lever pivotally secured to said fixed levers having an upper rod portion of said biasing lever operatively hanging a U-shaped hanger formed on an upper portion of said outer pipe and a lower rod portion protruding downwardly outwardly to operatively form an acute angle with said fixed levers, and a horizontal bar secured with an upper portion of said bait rope, said horizontal bar being clamped between said fixed levers and said biasing lever within said acute angle defined by said lower rod portion of said biasing lever and said fixed levers, whereby upon a taking of the bait to release the rope and the horizontal bar, the biasing lever will not be obstructed on the fixed levers and still be biased to downwardly move the upper rod portion to drop the outer pipe and the cup for catching an animal.

5,024,022

AUTOMOBILE WINDOW OPENING AND CLOSING DEVICE

Kazuo Ito, No. 102, Daiichi Fujinoki-soh, 2888, Haze-cho, Sakai-shi, Osaka-fu, Japan

Filed Jun. 19, 1990, Ser. No. 540,351

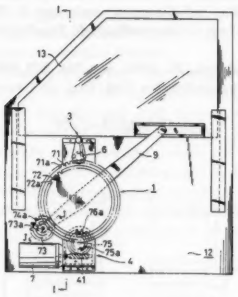
Claims priority, application Japan, Jul. 19, 1989, 1-185390[U]; Feb. 2, 1990, 2-10049[U]

Int. Cl.[5] E05F *15/00*

U.S. Cl. 49—139 **2 Claims**

1. An automobile window opening and closing device for lifting and lowering a window through pivotal movement of a driving arm under a drive force from a manually operated drive unit or a power-operated drive unit, comprising an up-and-down movable gear rotatably supported at one end of said driving arm and held in mesh with concentrically rotatably supported two gears so as to be pivotally movable along the outer peripheries of said two gears, said two drive units each being interlockingly connected with a corresponding one of said two gears, said two drive units each being equipped with a follow movement preventing mechanism for preventing the

one drive unit from rotating on its own axis when it is subjected to a drive force from the other drive unit, so that said



manually operated and power-operated drive units can be selectively operated for window lifting and lowering.

5,024,023

INSULATED REFRIGERATOR DOOR ASSEMBLY WITH SUBSTANTIALLY ALL GLASS FRONT DOORS

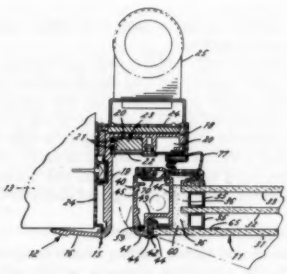
Jeffery Kostos; Melvin Kaspar, both of La Grange Park, and Paul Artwohl, Flossmoor, all of Ill., assignors to Ardco, Inc., Chicago, Ill.

Division of Ser. No. 448,328, Dec. 11, 1989, Pat. No. 4,998,382. This application Oct. 24, 1990, Ser. No. 602,791

The portion of the term of this patent subsequent to Mar. 12, 2008, has been disclaimed.

Int. Cl.[5] E06B *3/00*

U.S. Cl. 49—501 **13 Claims**



1. A refrigerator door assembly comprising a cabinet frame for mounting in an opening of a refrigerator cabinet, an insulated glass door mounted for movement relative to said cabinet frame, said glass door comprising an insulated glass unit having a plurality of glass panes disposed in side-by-side relation and including a forward pane and a pane disposed rearwardly of said forward pane, a spacer interposed between at least some of said panes for maintaining said panes in parallel relation with an air space therebetween, an outer door support frame about the periphery of said glass unit for supporting the weight of said glass unit, said forward glass pane being larger in size than said rearwardly disposed pane and extending outwardly substantially to the outer perimeter of said door, said support frame having at least a portion being disposed rearwardly of said forward glass pane and being without any portion extending in overlapping relation to a front side of said forward glass pane, and masking means on said forward glass pane about the periphery thereof for preventing viewing of said spacer through said forward glass pane from a front side thereof while permitting unobstructed viewing of the interior of the refrigerator cabinet within which said door is mounted.

5,024,024

GRINDING AND FINISHING APPARATUS AND METHOD

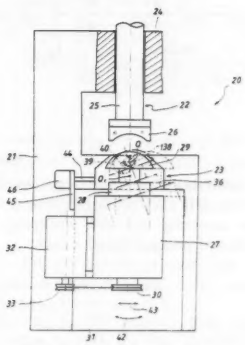
Masaki Watanabe, Hachiohji, Japan, assignor to Olympus Optical Company Limited, Japan

Filed Sep. 20, 1989, Ser. No. 410,081

Claims priority, application Japan, Oct. 20, 1988, 63-265080

Int. Cl.[5] B24B *13/02*

U.S. Cl. 51—124 L **18 Claims**



9. An apparatus for grinding a workpiece comprising: a rotatable workpiece shaft for carrying a workpiece to be ground so as to rotate the workpiece about a center axis thereof, the workpiece shaft having a longitudinal center axis; a rotatable tool shaft for carrying a tool having a curved grinding surface with a center of curvature lying on the center axis of the workpiece shaft; means for axially displacing the workpiece shaft relative to the tool shaft; first means mounting the tool shaft and the workpiece shaft for lateral movement relative to one another; second means mounting the tool shaft for swinging movement about a swing axis extending perpendicular to and intersecting the center axis of the workpiece shaft; and means for swinging the tool shaft about the swing axis in synchronism with lateral movement of the tool shaft and the workpiece shaft relative to one another so as to maintain the center of curvature of the tool grinding surface on the center axis of the workpiece shaft during grinding of the workpiece.

5,024,025

CONTROL SYSTEM OF GRINDING MACHINE

Hiroyuki Kihara, and Hideki Omori, both of Narashino, Japan, assignors to Seiko Seiki Kabushiki Kaisha, Japan

Filed Oct. 4, 1989, Ser. No. 416,842

Claims priority, application Japan, Oct. 4, 1988, 63-130099[U]; Oct. 14, 1988, 63-134236[U]; Oct. 14, 1988, 63-259004[U]

Int. Cl.[5] B24B *49/02*

U.S. Cl. 51—165.77 **5 Claims**

1. A control system of a grinding machine, comprising: electromagnets;

a spindle having a rotor shaft provided with a grinding stone, said rotor shaft being rotatively driven while being held afloat by magnetic forces of the electromagnets;

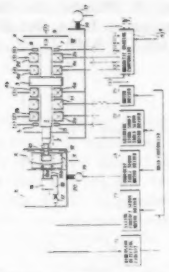
a head stock for supporting a workpiece;

an undercut table for adjusting an amount of variations in grinding dimensions by moving either of said spindle and said head stock;

a sizing detector for measuring an amount of variations in workpiece dimensions; and

control means for controlling said rotor shaft so that said rotor shaft is held afloat in a reference target position by adjusting exciting currents of said electromagnets and for controlling a movement of said undercut table which is moved back in such a direction that said grinding stone

separates from said workpiece when detecting that dimensional values of said workpiece reach predetermined values from a detection output of said sizing detector, said control means including a target position modifying



means for modifying a reference target levitating position of said rotor shaft in a retreating direction of said undercut table when detecting that said workpiece dimensional values reach said predetermined values.

5,024,026

SEGMENTAL GRINDING WHEEL

William B. Korb, Melrose, Conn., assignor to American Saw & Mfg. Company, East Longmeadow, Mass.

Filed Jul. 17, 1989, Ser. No. 380,585
Int. Cl.[5] B24D *5/00*
U.S. Cl. 51—206.4 **2 Claims**

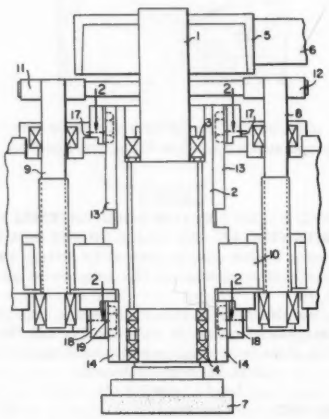
1. A segmental rotary grinding wheel for forming saw teeth on the edge of a blade comprising at least one array of circumferentially-spaced grinding segments having first and second angularly oriented grinding surfaces, at least one other array of such grinding segments disposed in partially coextensive and fixed axial relationship with the angularly oriented grinding surfaces of adacent segments of the two arrays defining the configuration of a saw tooth, the first and second grinding surface of the segments, in each array, having generally the same surface area as the corresponding surface of the other segments in that array, each of said arrays of grinding segments extending from the periphery of a circular disc with the discs being disposed in abutting coaxial relation and the grinding segments of one disc interdigitated between the segments of the other disc.

5,024,027

TOOL MOUNTING MECHANISM FOR A MACHINE TOOL

Alexander Hofsess, Dreieich, and Phon Dao-Xuan, Frankfurt, both of Fed. Rep. of Germany, assignors to Diskus Werke Frankfurt am Main Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jun. 21, 1990, Ser. No. 541,589
Claims priority, application Fed. Rep. of Germany, Jul. 13, 1989, 3923156
Int. Cl.[5] B24B *41/04*
U.S. Cl. 51—34 H **7 Claims**



1. In a tool mounting mechanism for a machine tool comprising

a spindle carrier having at least two axially spaced apart sleeve guiding means,

a spindle sleeve axially slidably and non-rotatably mounted in said spindle carrier by said sleeve guiding means,

a tool spindle, which extends through and is axially coupled to and rotatably mounted in said sleeve and has two opposite end portions axially protruding from said sleeve, one of said end portions being adapted to carry a tool,

a belt pulley fixed to the other of said end portions, and

screw means for axially adjusting said sleeve in said spindle carrier,

the improvement residing in that

at least one of said sleeve guiding means comprises at least three axially extending recesses, which are angularly spaced around said sleeve and each of which is provided on opposite sides with two axially extending linear roller bearings and

said sleeve has an outside peripheral surface and is provided on said surface with at least three axially extending ribs, each of which extends into one of said recesses and is in contact therein with two of said linear roller bearings.

5,024,028

AIRLESS BLAST CLEANING WHEEL AND HOUSING

Kirby L. Pierce, Hartford, and Richard C. Kanouse, Dousman, both of Wis., assignors to Midwest Blast Products, Inc., Brookfield, Wis.

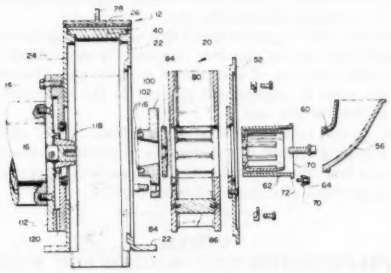
Continuation of Ser. No. 4,378, Jan. 16, 1987. This application Feb. 27, 1989, Ser. No. 316,552
Int. Cl.[5] B24C *5/06*
U.S. Cl. 51—432 **7 Claims**

1. In a centrifugal blast cleaning system having an impeller blade wheel axially fed with blast cleaning abrasive, an improvement comprising:

a front access plate means having a feed funnel projecting

therethrough for delivering abrasive to the axis of the cleaning wheel, said front access plate means being removable from the remainder of the housing by removal of fastener means, said front access plate means being of sufficiently large dimensions to permit access to and removal of the wheel and to permit access to and insertion and removal of impeller blades;

a motor mounting plate for supporting a motor directly connected thereto and having a motor output shaft receiving aperture therethrough and having an output shaft directly connected to drive the impeller blade wheel and having primary and secondary seals, the secondary seal comprising a metal to metal labyrinth seal, said seals having a separation therebetween positioned between the motor shaft and the interior of the housing, such that the motor is protected from exposure to blast cleaning abrasive;



in combination first and second blade mounting disks held parallel to each other by standoffs, each of said disks bearing on an innerface thereof cooperating channels in the surface thereof for receiving shoulder projections from side edges of impeller blades and supporting the shoulders of the impeller blades in the channels for rotation about the axis of the disks, each of the disks having axial apertures therethrough for feeding abrasive onto the blades when the wheel is rotated, said slots being constructed and arranged for engaging the projecting shoulders on the blades, said slots terminating prior to the circumference of the disks, and said slots thereby centrifugally securing the blades in position as the wheel is rotated; and

only three interior replaceable abrasive resistant liner elements.

5,024,029

ABRASIVE MEDIA VALVE SYSTEM

Kenneth E. Abbott, and Patrick J. Lyons, both of Tucson, Ariz., assignors to Stripping Technologies Inc., Tucson, Ariz.

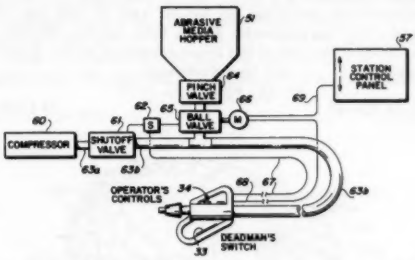
Continuation-in-part of Ser. No. 253,237, Oct. 4, 1988, Pat. No. 4,901,928. This application Oct. 30, 1989, Ser. No. 429,052

Int. Cl.[5] B24C *7/00*

U.S. Cl. 51—438 **10 Claims**

1. A media mixing valve system for an abrasive blasting system, said media mixing valve system comprising:

(a) a remotely regulated valve for the selective delivery of abrasive media to a pressurized air stream and wherein said remotely regulated valve is activatable by a station control panel and an operator control panel; and,



(b) a pinch valve for blocking access of the abrasive media from a blast generator to said remotely regulated valve.

5,024,030

SPACE DIVIDER SYSTEM

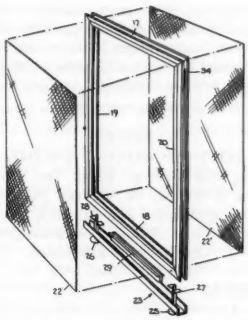
Andrew I. Morrison, East Setauket, N.Y., assignor to Knoll International, Inc., New York, N.Y.

Division of Ser. No. 560,877, Dec. 13, 1983. This application Dec. 2, 1985, Ser. No. 803,552

The portion of the term of this patent subsequent to Feb. 4, 2003, has been disclaimed.

Int. Cl.[5] B24B *7/00*

U.S. Cl. 52—36 **1 Claim**



1. In an office system of interconnected panels and posts, the improvement for interconnecting a first panel to an adjacent second panel or post and also providing a support for accessory components in the region between said first panel and adjacent second panel or post comprising a standard adapted to be positioned between said first panel and said adjacent second panel or post, said standard having opposing sides and front and rear faces, wedging means at both ends of said standard for placing said standard in tension by drawing said first panel and said adjacent second panel or post against the opposing sides of said standard, said standard also including support means on at least one face thereof for supporting one or more accessory components therefrom, which support means are exposed when said first panel is interconnected to an adjacent second panel or post, each component accessory being provided with a bracket that hooks onto the exposed support means on the face of the standard, the other exposed face of the standard being provided with support means for supporting a component accessory therefrom, which support means are exposed when said first panel is interconnected to an adjacent second panel or post.

5,024,031

RADIAL EXPANSION/RETRACTION TRUSS STRUCTURES

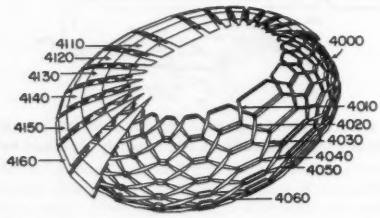
Charles Hoberman, 472 Greenwich St., New York, N.Y. 10013

Continuation-in-part of Ser. No. 263,582, Oct. 27, 1988, Pat. No. 4,942,700. This application Apr. 6, 1990, Ser. No. 505,804

The portion of the term of this patent subsequent to Sep. 4, 2007, has been disclaimed.

Int. Cl.[5] E04B *1/32, 1/00*

U.S. Cl. 52—81 **24 Claims**



1. A loop-assembly comprising:

at least three scissors-pairs, at least two of the pairs comprising:

two essentially identical rigid angulated strut elements, each having a central and two terminal pivot points which do not lie in a straight line, each strut being pivotally joined to the other of its pair by their central pivot points,

each pair being pivotally joined by two terminal pivot points to two terminal pivot points of another pair such that both scissors pairs lie essentially in the same plane,

whereby a closed loop-assembly is thus formed of scissors pairs, and this loop-assembly can fold and unfold, and

a line that intersects and is perpendicular to the axes of any two terminal pivot points is non-parallel with at least two other similarly formed lines in the assembly,

the angles formed between said lines remaining constant as the loop assembly is folded and unfolded.

5,024,032

POST-TENSIONING ANCHOR

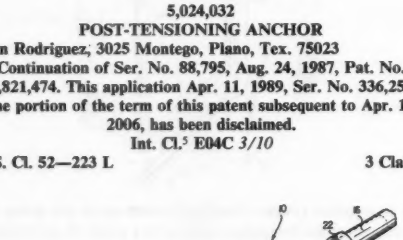
Alan Rodriguez, 3025 Montego, Plano, Tex. 75023

Continuation of Ser. No. 88,795, Aug. 24, 1987, Pat. No. 4,821,474. This application Apr. 11, 1989, Ser. No. 336,254

The portion of the term of this patent subsequent to Apr. 18, 2006, has been disclaimed.

Int. Cl.[5] E04C *3/10*

U.S. Cl. 52—223 L **3 Claims**



1. An improved post-tensioning anchor plate assembly of the type constructed for securement in a concrete structure defined by pour forms and the receipt of a tensioning tendon therethrough, having means for securing said tensioning tendon therein in taut engagement, wherein said improvement comprises:

an anchor plate housing having first and second faces, said first face being adapted for facing inwardly toward said concrete with said second oppositely disposed face adapted for facing outwardly therefrom;

said anchor plate housing further being constructed with a central aperture formed therethrough, said aperture having a first collar region formed on said first face and a second oppositely disposed face adapted for facing outwardly therefrom;

said anchor plate housing further being constructed with a central aperture formed therethrough, said aperture having a first collar region formed on said first face and a second collar region formed on said second face, said first and second collar regions being concentrically aligned one with the other;

a tubular member adapted for engagement with said first anchor plate face for extension outwardly therefrom into said concrete with said tendon extending therethrough, said tubular member having at least one ear formed thereon and adapted for receipt of a filament therearound for securement to said plate, a second ear formed thereon substantially opposite said first ear for facilitating receipt of a filament therearound;

said first collar region having a first tubular engaging surface with an outside diameter substantially equivalent to an inside diameter of said tubular member and adapted for the press fit engagement thereof for the sealing of said tendon therein; and

said second collar region having a second tubular member engaging surface of substantially equivalent diameter to said first tubular member engaging surface for permitting securement of a second member thereon.

5,024,033

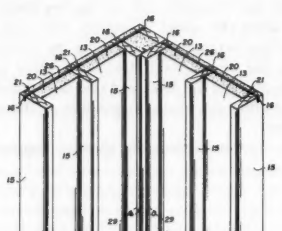
PREFABRICATED CONSTRUCTION UNIT WITH INSULATION

Ray L. Anderson, Box 3031, Langley, British Columbia V3A, 4R3, Canada

Continuation of Ser. No. 114,516, Oct. 30, 1987, abandoned. This application Mar. 15, 1989, Ser. No. 323,171

Int. Cl.[5] E04B *2/46*

U.S. Cl. 52—407 **10 Claims**



1. A pre-formed insulated wall construction unit comprising:

a support framework utilizing spaced spanning members mounted between upper and lower cross members to form a wall unit having a series of open compartments with first and second pairs of opposed edges defined by said spaced, spanning members and said upper and lower cross members, respectively, said open compartments being occupied by rigid insulation having grooved edges, sealing strips with a T shaped cross-section attached to said first pair of opposed edges of said compartment, the head of the T being an attachment flange to secure said strip to a framework member, and the leg of the T being an engagement flange formed with a single angled flexible finger at an acute angle to the plane of the engagement flange to seat in said grooves in said rigid insulation in order to hold

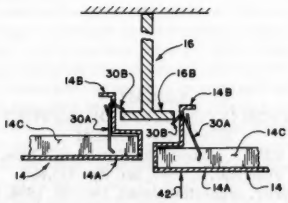
said insulation securely within said open compartments, said second pair of opposed edges being bonded directly to the adjacent edges of said rigid insulation.

5,024,034

NON-DIRECTIONAL SUSPENDED CEILING PANELS

J. Lynn Gailey, Clover, S.C., assignor to Alcan Aluminum Corporation, Cleveland, Ohio

Filed Dec. 1, 1989, Ser. No. 444,624
Int. Cl.[5] E06B *3/54*
U.S. Cl. 52—484 **13 Claims**



1. Apparatus comprising an inverted T-beam support member, a ceiling panel, and a latch structure for suspending the ceiling panel from the inverted T-beam support member;

said latch structure being coupled with said ceiling panel and being movable therewith relative to said inverted T-beam support member;

said latch structure being moveable relative to said ceiling panel and being biased by gravity toward a locking position;

said latch structure being adapted to engage the inverted T-beam support member to suspend said portion of said ceiling panel therefrom when said ceiling panel is in a predetermined orientation relative to said inverted T-beam support member and said latch structure is in said locking position; and

said latch structure being adapted to be moved relative to said ceiling panel and away from said locking position to enable said ceiling panel to be suspended from or separated from the inverted T-beam support member;

wherein said latch structure includes a locking portion extending away from said ceiling panel when said latch structure is in said locking position;

said locking portion being disposed to be engaged by an inverted T-beam support member as said ceiling panel is being moved to said predetermined orientation relative to said inverted T-beam support member;

said latch structure being movable away from said locking position by engagement of said locking portion of said latch structure with said inverted T-beam support member as said ceiling panel is being moved to said predetermined orientation; and

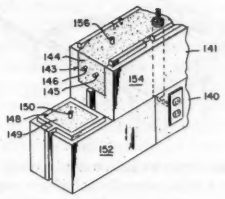
said latch structure being biased by gravity to its locking position when said ceiling panel has been moved to said predetermined orientation, to enable said latch structure to support said ceiling panel from said inverted T-beam member when said ceiling panel has been moved to said predetermined orientation.

5,024,035

BUILDING BLOCK AND STRUCTURES FORMED THEREFROM

Gary N. Hanson, and Keith W. Inness, both of Seattle, Wash., assignors to Insulock Corporation, Seattle, Wash.

Continuation of Ser. No. 85,871, Oct. 18, 1979, abandoned, which is a continuation of Ser. No. 966,082, Dec. 4, 1978, abandoned. This application Apr. 28, 1981, Ser. No. 258,052
Int. Cl.[5] E04C *1/10*
U.S. Cl. 52—591 **3 Claims**



1. A wall structure, comprising:

a) a plurality of lightweight, non-cementitious, resilient, plastic foam material, first blocks, each first block having a generally rectangular exterior configuration and comprising a pair of opposed first side walls; a pair of opposed first end walls having heights equal to that of the first side walls; a first interior wall having a height equal to that of the first side walls and extending between the first side walls approximately parallel to the first end walls, the first interior wall forming two first vertical passages through the first blocks of approximately equal, rectangular cross-sections; first projections on the upper surfaces of the first end, side and interior walls, the firt projections being formed into two identical first patterns respectively associated with said two first passages; and the lower surfaces of the first side, end and interior walls being shaped so as to form first recesses identical to the first projections in size and shape, and directly below the first projections in position, the first blocks being positioned side by side to form first horizontal rows;

b) a plurality of lightweight, non-cementitious, resilient, plastic foam material second blocks, each second block having an exterior size and configuration similar to the first blocks and comprising a pair of opposed second side walls; a pair of opposed second end walls having heights appreciably less than that of the second side walls; a second interior wall having a height equal to that of the second end walls and extending between the second side walls approximately parallel to the second end walls; the second interior wall forming two second vertical passages through the second forms of approximately equal, rectangular cross-sections; second projections on the upper surface of each second side wall, the second projections being formed into two identical second patterns respectively associated with the two second passages; and the lower surfaces of the second side, end and interior walls being shaped so as to form second recesses, a portion of such second recesses being identical to the second projections in size and shape and directly below the second projections in position, the second blocks being positioned side by side to form second horizontal rows and horizontal passages through said horizontal row of second blocks, said first and second rows being positioned one on top of another such that the projections of the forms in each row are received within the recesses of the forms in the row above and the passages in successive rows are aligned to form vertical openings extending through more than one row; and

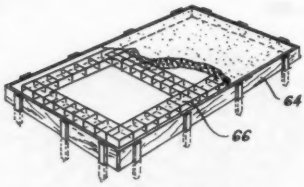
c) load bearing structures extending at least through one of said vertical openings.

5,024,036

INTERLOCKING SUPPORT STRUCTURES

David W. Johnson, 1884 Sunset Blvd., San Diego, Calif. 92103

Continuation-in-part of Ser. No. 231,379, Aug. 12, 1988. This application Jun. 21, 1990, Ser. No. 541,547
Int. Cl.[5] E04H *12/18*
U.S. Cl. 52—600 37 Claims



1. A multi-celled support lattice comprising:
(a) a plurality of adjacent cells defining a support surface;
(b) each of said cells having twelve edges and each edge being defined by a pair of elongated structural members, with each cell sharing common member pairs with any adjacent cells;
(c) each of said cells having eight corner joints, each being defined by the intersection of three interlocking structural member pairs;
(d) said joints each defining X, Y, and Z directions and comprising:
(i) said elongated structural member pairs being formed into an X-directional parallel contiguous pair, a Y-directional parallel contiguous pair, and a Z-directional parallel contiguous pair;
(ii) said parallel contiguous pairs intersecting one another to define said joint between said six elongated structural members such that said joint has:
(1) three elongated structural members that are each only full notched to define a full notch, said full notch being of length substantially equal to twice the thickness of said structural members and of depth substantially equal to half the thickness of said structural members such that when paired with an oppositely-directed full-notched member a pass-through opening is defined which will snugly fit a pair of members inserted orthogonally therethrough;
(2) two of said members having similar full notches and also having an additional half notch, said half notch being formed at 90 degrees to the full notch and substantially at mid-span of the full notch; and,
(3) the sixth elongated structural member having no notches at said joint and being the key post that holds the remaining five members together as a joint; and,
(iii) said joint comprising an interlocking joint held together by the interlocking configurations of the elongated structural members themselves such that said lattice is rigid without the use of fasteners at the joints.

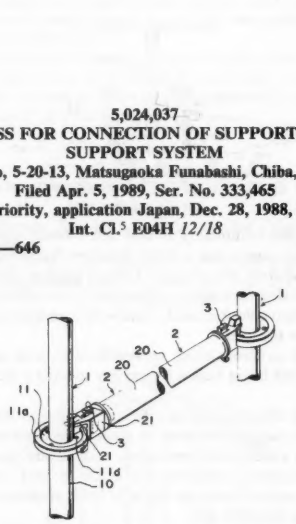
35. A concrete reinforcing structure to be imbedded in wet concrete comprising:
(a) a plurality of intersecting elongated member pairs interlocking at the intersections to define joints;
(b) said joints each defining X, Y, and Z directions and comprising:
(i) a plurality of elongated structural member pairs formed into an X-directional parallel contiguous pair, a Y-directional parallel contiguous pair, and a Z-directional parallel contiguous pair;
(ii) said parallel contiguous pairs intersecting one another to define said joint between said six elongated structural members such that said joint has:
(1) three elongated structural members that are each only full notched to define a full notch, said full notch being of length substantially equal to twice the thickness of said structural members and of depth substantially equal to half the thickness of said structural members such that when paired with an oppositely-directed full-notched member a pass-through opening is defined which will snugly fit a pair of members inserted orthogonally therethrough;
(2) two of said members having similar full notches and also having an additional half notch, said half notch being formed at 90 degrees to the full notch and substantially at mid-span of the full notch; and,
(3) the sixth elongated structural member having no notches at said joint and being the key post that holds the remaining five members together as a joint; and,
(iii) said joint comprising an interlocking joint held together by the interlocking configurations of the elongated structural members themselves such that said lattice is rigid without the use of fasteners at the joints.

5,024,037

PROCESS FOR CONNECTION OF SUPPORTS, AND SUPPORT SYSTEM

Tatsuo Ono, 5-20-13, Matsugaoka Funabashi, Chiba, Japan

Filed Apr. 5, 1989, Ser. No. 333,465
Claims priority, application Japan, Dec. 28, 1988, 63-331310
Int. Cl.[5] E04H *12/18*
U.S. Cl. 52—646 17 Claims



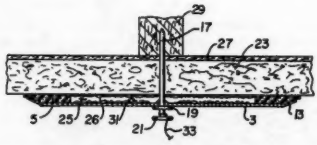
1. A support system which comprises cloumnar members each provided with a plurality of flanges spaced apart along the longitudinal direction of the columnar members, connecting members each provided with joint shoes at end portions thereof, and wedges to be driven into the joint shoes, wherein the flanges are each provided with a supporting piece along the circumferential direction thereof, and the joint shoes each comprises a hollow housing having a pair of opposed wall bodies, and a hook fitted loosely and movably in the housing, the wall bodies and the hook being provided with respective wedge insertion holes opposed to each other, and the hook being provided at an end portion thereof with a catch portion to be disengageably engaged with the supporting place of the flange, whereby when the wedge is driven into each of the wedge insertion holes in the condition where the catch portion is opposed to the supporting piece, the hook is retracted to engage the catch portion with the supporting piece, an end portion of each of the wall bodies is pushed outward into contact with the outer surface of the columnar member and an elastic member is provided at an inner rear portion of the housing to constantly bias the hook to the outside of the housing.

5,024,038

APPARATUS AND METHOD FOR PROVING AN ANCHOR IN WALLS AND CEILINGS COMPOSED OF FRIABLE ASBESTOS CONTAINING MATERIAL

Donald D. DePellegrini, Pittsburgh; William E. Acker, Allison Park, and Richard Hoff, Coraopolis, all of Pa., assignors to University of Pittsburgh, Pittsburgh, Pa.

Filed Apr. 16, 1990, Ser. No. 509,475
Int. Cl.[5] E04B *2/00, 9/00*
U.S. Cl. 52—700 16 Claims



1. Apparatus for providing an anchor in walls and ceilings containing friable asbestos containing materials, said apparatus comprising:

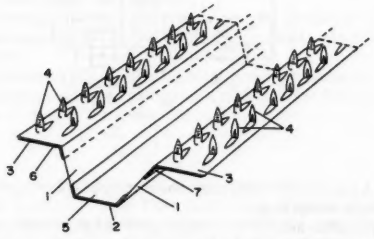
a plate member which is placed against the wall or ceiling and generally centered over a selected anchor point, a peripheral seal between the plate and the wall or ceiling providing an airtight seal completely around said plate member, and a fastener having a shaft which is driven through said plate placed against said wall or ceiling and which penetrates and securely engages said wall or ceiling behind the plate member at said selected anchor point, said fastener dislodging friable material from a disturbed portion of said wall or ceiling surrounding said anchor point as the shaft penetrates the wall or ceiling, said fastener also having an anchor member secured to said shaft outside said plate and having a flange which bears against and clamps said plate member and peripheral seal permanently against said wall or ceiling, said plate member covering the entire disturbed portion of said wall or ceiling surrounding said anchor point from which friable asbestos containing material is dislodged as said shaft penetrates said wall to trap and permanently contain said dislodged friable asbestos containing material.

5,024,039

ENGAGEMENT PROFILE OR BEAM

Markku Karhumäki, Erkyläntie, SF-11130 Riihimäki, Finland

Continuation of Ser. No. 162,391, Mar. 4, 1988, abandoned. This application Dec. 6, 1989, Ser. No. 449,379
Claims priority, application Finland, Jul. 4, 1986, 862835
Int. Cl.[5] E04C *3/07*
U.S. Cl. 52—735 9 Claims



1. A beam for use in construction for fastening to a building construction element in a bearing portion of a joint structure comprising:

a beam-shaped member made of a substantially thin sheet metal and including:

two side members;

two fastening strips, each fastening strip extending outwardly in an angular position from a first edge of one of said respective side members;

an intermediate strip extending between second edges of said side members to define a bottom of said beam-shaped member; said side members and said intermediate strip forming a substantially flat-bottomed V-shaped configuration;

a plurality of fastening means being provided at said each fastening strip and substantially closely spaced along the surface of said fastening strip, said fastening means being shaped such as to penetrate into the building construction element upon pressing of said fastening strip against the building construction element for fastening said beam-shaped member to said building construction element; and

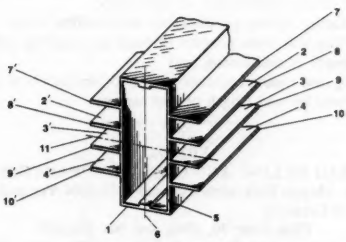
at least one reinforcement member made as a separate piece and being provided on at least said intermediate strip at least in the interior of said V-shaped configuration, said reinforcement member extending in the longitudinal direction of said intermediate strip for increasing the bending strenght of said beam-shaped member, said reinforcement member being arranged across said intermediate strip to reach at least said second edges of said side members and being affixed to said V-shaped configuration or said thin-sheet metal member.

5,024,040

CURVED TUBULAR PROFILE

Henri G. Leurent, Tourcoing, France, assignor to Brelan, S.A., Luxembourg, Luxembourg

Filed Feb. 17, 1989, Ser. No. 312,858
Claims priority, application France, Feb. 18, 1988, 88 01913
Int. Cl.[5] E04B *2/00*
U.S. Cl. 52—738 5 Claims



1. A metal profile for forming arches used in covering structures, comprising:

a curvilinearly extending tubular central bearing body having opposed sides and having, in a transverse cross section veiw, a vertical axis of symmetry and a horizontal axis of symmetry; and

a plurality of fins arranged on above the other and together defining at least three grooves on each side of said body, said fins extending from each of said opposed sides of said body, being perpendicular to said vertical axis and being distributed symmetrically with respect to said horizontal axis; wherein each of said fins extends from the body to an end and exhibits, in a transverse cross sectional view, a straight top edge extending from the body to the end of a straight bottom edge extending from the body to the end, said top and bottom edges each extending perpendicular to the vertical axis and wherein said profile comprises a single piece.

5,024,041
PROCESS FOR FILLING TUBULAR CASINGS

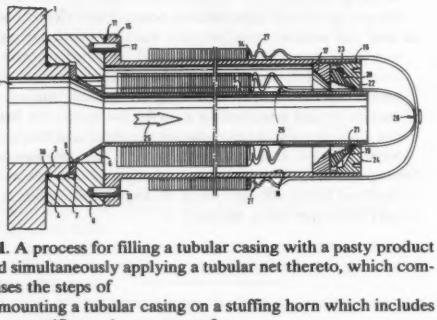
Rudolf Urban; Josef Fritsch, both of Taunusstein, and Klaus-Peter Schoen, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 1, 1989, Ser. No. 345,182

Claims priority, application Fed. Rep. of Germany, May 6, 1988, 8806038[U]

Int. Cl.[5] B65B *11/58, 9/12;* **A22C** *11/00*

U.S. Cl. 53—449 **4 Claims**



1. A process for filling a tubular casing with a pasty product and simultaneously applying a tubular net thereto, which comprises the steps of

mounting a tubular casing on a stuffing horn which includes an orifice and an outer surface,

mounting a tubular net on a support tube having an end in the vicinity of said orifice and coaxially surrounding said stuffing horn,

passing a first end of said casing between a brake and said outer surface of said stuffing horn, wherein said brake is disposed entirely within the interior of said support tube in the vicinity of said orifice and encircles said stuffing horn,

pulling a first end of said tubular net over the end of said support tube,

closing said first end of said casing, together with said first end of said tubular net, at said orifice,

introducing a pasty product into said stuffing horn,

extruding said pasty product through said stuffing horn into a length of said casing, and

closing said casing together with said tubular net at a point defined by said length of said casing.

5,024,042
BAG FILLING AND CLOSING APPARATUS

Hans-H. Meyer, Rotkehlchenstrasse 1, D-4804 Versmold, Fed. Rep. of Germany

Filed Mar. 30, 1990, Ser. No. 501,803

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1989, 3910208

Int. Cl.[5] B65B *43/14, 5/04*

U.S. Cl. 53—168 **6 Claims**

1. A bag filling and closing apparatus comprising:

a bag filling station for receiving an opened bag to be filled and for filing in a material into the opened bag;

a first bag supplying station disposed on a first side of said bag filling station;

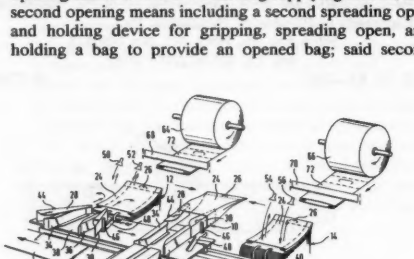
a second bag supplying station disposed on a second side of said bag filling station;

a movable carriage means movable back and forth between said bag filling station and said first and second bag supplying stations;

first opening means disposed on said movable carriage means for receiving and opening a bag when said first opening means is at said first bag supplying station, said first opening means including a first spreading open and holding device for gripping, spreading open, and holding a bag to provide an opened bag; said first opening means holding the opened bag to be filled when said first opening means is at said bag filling station;

second opening means disposed on said movable carriage means for receiving and opening a bag when said second opening means is at said second bag supplying station, said second opening means including a second spreading open and holding device for gripping, spreading open, and holding a bag to provide an opened bag; said second opening means holding the opened bag to be filled when said second opening means is at said bag filling station; and

said movable carriage means alternately moving said first opening means between said bag filling station and said first bag supplying station, and said movable carriage means alternately moving said second opening means between said second bag supplying station and said bag filling station.



5,024,043
MACHINE FOR WRAPPING SUBSTANTIALLY PARALLELEPIPED COMMODITIES

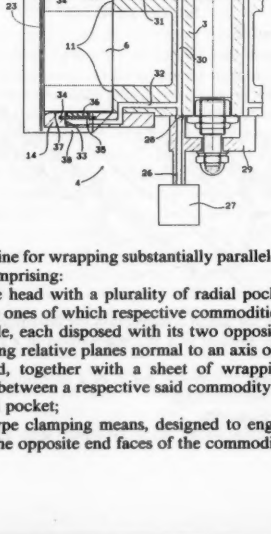
Fiorenzo Draghetti, Medicina, and Antonio Gamberini, Bologna, both of Italy, assignors to G.D. Societa Per Azioni, Bologna, Italy

Filed May 7, 1990, Ser. No. 519,457

Claims priority, application Italy, May 9, 1989, 3456 A/89

Int. Cl.[5] B65B *11/32*

U.S. Cl. 53—234 **7 Claims**



1. A machine for wrapping substantially parallelepiped commodities, comprising:

a rotatable head with a plurality of radial pockets into respective ones of which respective commodities are singly insertable, each disposed with its two opposite end faces occupying relative planes normal to an axis of rotation of the head, together with a sheet of wrapping material located between a respective said commodity and respective said pocket;

pressing-type clamping means, designed to engage at least one of the opposite end faces of the commodity and hold

the commodity in position within the pocket during transfer of the pocket from a point of entry into the head to a point of exit from the head, in such a way as to disallow movement of the commodity internally of the respective pocket and prevent any relative movement of the commodity and the respective sheet of wrapping material;

each said radial pocket being encompassed by a bottom wall, two substantially radial walls and two side walls normal to the axis of rotation of the head, and accommodates a respective commodity enveloped entirely by the sheet of wrapping material save for an area of the two end faces offered to the side walls;

said pressing-type clamping means comprising a source of compressed air, a pneumatic circuit associated with each pocket, valve means by which the circuit is connected to the source during occupation of the pocket by the commodity, and pad means located at one end of the pneumatic circuit associated with each pocket, operating in conjunction with the side walls of the pocket and directed against only said uncovered area of at least one of the opposite end faces of a commodity occupying the pocket.

5,024,044

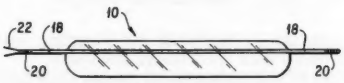
PROCESS FOR PRODUCING AN EASILY OPENED PACKAGE

Steven G. Friedrich, Greer, and Kent A. Davis, Travelers Rest, both of S.C., assignors to W. R. Grace & Co.-Conn., Duncan, S.C.

Division of Ser. No. 62,532, Jun. 12, 1987, Pat. No. 4,859,514. This application May 5, 1989, Ser. No. 348,319

Int. Cl.[5] B65B *31/02, 47/02*

U.S. Cl. 53—433 **4 Claims**



1. A process for producing a package having a peel opening force of less than about 2.5 pounds per inch comprising:

(a) forming a first web having a sealant layer comprising a polymeric material selected from the group consisting of ionomer, and a blend of said ionomer and ethylene vinyl acetate copolymer;

(b) placing the article on the first formed web;

(c) disposing the second web having a sealant layer comprising a blend of ethylene vinyl acetate copolymer, ethylene butene copolymer, and polypropylene over the product to form an enclosure;

(d) heating the second web;

(e) vacuumizing the enclosure;

(f) forming a perimeter seal at or near the periphery of the package by heat sealing the first and second webs thereat; and

(g) forming a bonded area adjacent to said perimeter seal by causing the heated second web to tack to the first web so as to enclose the article between the webs.

5,024,045

PANEL PACKAGING SYSTEM

Stewart L. Fluent, Cedar Falls; Colin Hart, Waterloo, both of Iowa; Charles D. McCree, King of Prussia, Pa., and Charles F. Lotsch, Audubon, Pa., assignors to CertainTeed Corporation, King of Prussia, Pa.

Continuation of Ser. No. 317,744, Mar. 2, 1989, Pat. No. 4,941,309. This application May 17, 1990, Ser. No. 524,546

Int. Cl.[5] B65B *35/50, 35/56*

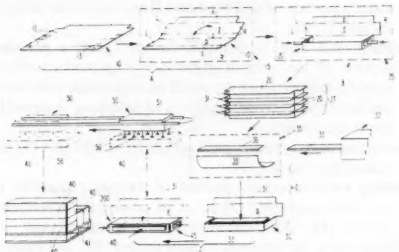
U.S. Cl. 53—443 **2 Claims**

1. A method for sequentially receiving extruded vinyl panels, re-orienting selected panels, combining panels pairs and packing the pairs in a waiting container, comprising the steps of:

(a) receiving a first panel in a horizontal orientation;

(b) transposing said first panel to a first orientation and depositing said first panel on an adjacent and movable surface;

(c) receiving a second panel in a horizontal orientation;



(d) transposing said second panel to a second orientation and depositing said second panel in a pre-determined position adjacent said first panel to form a combination therewith;

(e) moving the combination of said first and second panels into a container; and

(f) repeating steps a through e until a predetermined number of panel combinations have been moved into said container.

5,024,046

METHOD AND DEVICE FOR WRAPPING CYLINDRICAL PRODUCTS

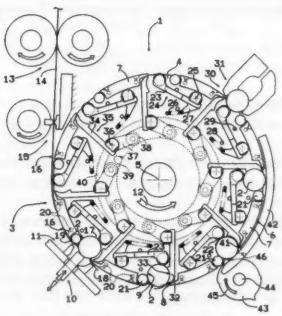
Mario Spatafora, and Antonio Gamberini, both of Bologna, Italy, assignors to G. D Societa per Azioni, Bologna, Italy

Filed Mar. 14, 1990, Ser. No. 494,157

Claims priority, application Italy, Mar. 14, 1989, 3375 A/89

Int. Cl.[5] B65B *11/04*

U.S. Cl. 53—466 **11 Claims**



1. A method of wrapping cylindrical products (2), particularly groups of cylindrical sweet arranged side by side, characterised by the fact that it comprises stages consisting in:

successively feeding a conveyor (3) with portions of wrapping material (16); said conveyor (3) presenting a series of seats (9), each designed to receive a respective said product (2); each said seat (9) being arranged crosswise in relation to the travelling direction (12) of said conveyor (3), and having a lateral inlet (8); and each said portion of wrapping material (16) being retained on said conveyor in such a position as to substantially close a respective said inlet (8);

successively feeding, inside each said seat (9) at a loading station (11), an unwrapped product (2) together with a

portion (17) of said respective portion of wrapping material (16); an inner surface of said seat (9) being defined, at least partialiy, by rollers (21, 22) mounted in idle manner on said conveyor (3) in such a manner that each turns about its axis perpendicular to said travelling direction (12); insertion of each said product (2) inside a respective said seat (9) causing a portion (17) of said respective portion of wrapping material (16) to fold in the form of a U about a portion of said product (2) and in contact with said rollers (21, 22);

feeding each said product (2) forward until a peripheral portion of the same engages a rolling surface (41) for rotating said product (2) about its axis inside said seat (9) and fully wrapping said portion of wrapping material (16) about the same;

unloading said wrapped product (2) from said seat (9) at an unloading station (30);

feeding each separated portion of wrapping material (16) onto said conveyor (3) so as to present an intermediate portion (17) facing the inlet (8) of the seat (9); and

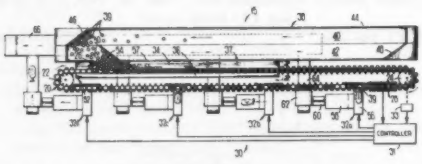
folding back, via external folding means (43), the from end portion (18) of the separated portion of wrapping material (16), and maintaining the fron end portion (18) in contact with the product (2) as the same engages the rolling surface (41).

5,024,047

WEIGHING AND SORTING MACHINE AND METHOD

William H. Leverett, Greenville, Ga., assignor to Durand-Wayland, Inc., Lagrange, Ga.

Filed Mar. 8, 1990, Ser. No. 491,247
Int. Cl.[5] B65B *5/10*
U.S. Cl. 53—502 **12 Claims**



1. An apparatus for filling a container to a predetermined weight with a plurality of articles having varied weights, comprising:

a continuous conveyor driven in a horizontal plane through a loading zone, a weighing zone, and at least one discharge zone;

a plurality of cups attached to said continuous conveyor, each cup passing through said loading zone so that each empty cup receives an article from a group of said articles;

a scale in said weighing zone to determine the weight of said articles in each said cup;

a discharge mechanism in said discharge zone selectively activated at least one of said plurality of cups so that said article moves from said cup into said container; and

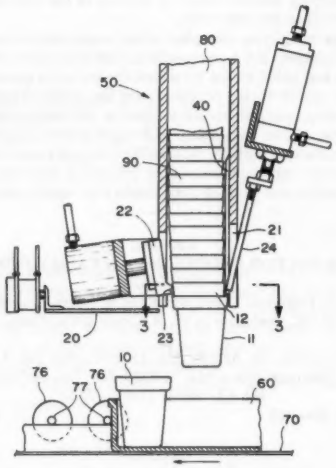
a controller to accumulate the sum of the weights of said articles discharged into said container until said sum exceeds a predetermined fraction of said predetermined weight and then to select at least one of said articles in said plurality of cups to discharge into said container, said selected article having a weight sufficient to increase the accumulated weight in said container to no less than said predetermined weight, each said article remaining in its respective cup and passing repeatedly through said weighing zone and said discharge zone until said article is discharged into a container.

5,024,048

APPARATUS FOR DISPENSING CONTAINERS

Richard L. Moore, Fairhope, Ala., assignor to The Lerio Corporation, Mobile, Ala.

Filed Jun. 15, 1990, Ser. No. 538,907
Int. Cl.[5] B65B *5/08;* **B65G** *59/06;* **B65H** *3/44*
U.S. Cl. 53—534 **16 Claims**



1. An apparatus for separating and dispensing individual containers from a stack of containers comprising:

at least one hollow column having an open upper and lower mouth for holding a stack of containers substantially vertical, each of said hollow columns being operatively associated with:

(a) a first extendable arm operatively associated with said hollow column whereby when said first extendable arm is extended into the lower mouth of said hollow column, said stack of containers will be prevented from falling out of said column;

(b) a second extendable arm operatively associated with said hollow column whereby after said first extendable arm is extended and thereafter said second extendable arm is extended, said second extendable arm will contact the penultimate container in the stack of containers and press said container against the side of said hollow column opposite to said second extendable arm;

(c) a wedge affixed to the inside of said hollow column on the side of said column opposite to said second extendable arm, the length of said wedge and the length of said column being substantially parallel, said wedge terminating above the bottom container in said stack of containers whereby when said second extendable arm is extended and said stack of containers is pressed against said wedge, the bottom container in the stack of containers will not be pressed against the wedge and the lip of the bottom container will extend in the direction opposite said second extendable arm further than the lips of the other containers in said stack of containers; and

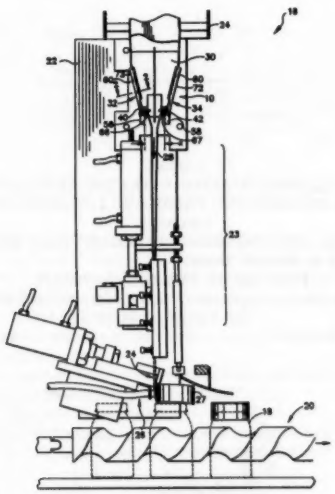
(d) a third extendable arm operatively associated with said hollow column whereby said third extendable arm may extend to contact said bottom container in said stack of containers, whereby said bottom container is separated from said stack of containers.

5,024,049

BAND GUIDING AND FORMING ASSEMBLY FOR BANDING APPARATUS

Eric W. Strub, 235 Rockhill Rd., Vista, Calif. 92084, and Kenneth M. Strub, 25670 Jesmond Dene, Escondido, Calif. 92026

Continuation-in-part of Ser. No. 160,848, Feb. 26, 1988, Pat. No. 4,914,893. This application Feb. 20, 1990, Ser. No. 481,965
Int. Cl.[5] B65B *9/13*
U.S. Cl. 53—585 15 Claims



1. A band guiding and forming apparatus for opening and smoothing flattened tubular banding material having opposing creased lines, comprising:

guide means for opening out and guiding tubular banding material along a travel path;

the guide means including inner guide means extending along the travel path for positioning inside the tubing material, an outer opposed guide means on opposite sides of the travel path for supporting the inner guide means and for guiding opposed portions of the tubing walls between the inner and outer guide means;

the inner guide means comprising a wedge-like member having a first pair of opposed tapering portions of substantially continuously and uniformly reducing width extending along substantially the whole length of the wedge-like member in the travel direction contacting the band within said crease lines and a second pair of opposed tapering portions extending alongside the first pair of tapering portions in a plane perpendicular to said first pair and of substantially continously and uniformly increasing width extending along substantially the whole length of the wedge-like member in the travel direction for gradually spreading and opening the tubing material, and a pair of opposed inner pinch rollers, each inner pinch roller being mounted on a respective one of said first pair of opposed tapering portions for rotatably engaging respective opposed interior surface portions of said crease lines; and

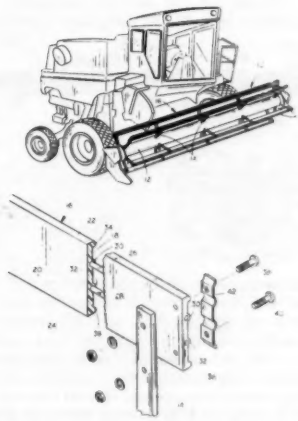
the outer guide means including a pair of opposed outer pinch rollers located on opposite sides of the travel path adjacent respective ones of said inner pinch rollers for rotatably engaging opposite surface portions of said banding material and pressing said portions between respective inner and outer pinch rollers for flattening and smoothing said crease lines between said rollers.

5,024,050

REEL BAT

Monte Leidenix, 2100 S. 29th St., Apt. 118, Grand Forks, N. Dak. 58201

Filed Feb. 14, 1990, Ser. No. 479,625
Int. Cl.[5] A01D *57/02*
U.S. Cl. 56—220 5 Claims



1. In combination with a harvester having a harvester reel mounted thereon which is comprised of a plurality of reel arms extending radially outwardly from a central rotatable shaft, comprising:

a plurality of reel bats removably secured to said reel arms; each of said reel bats comprising an elongated, generally rectangular plastic member having front and back surfaces, a leading edge and a trailing edge, and at least one longitudinally extending reinforcing member embedded in said plastic member extending substantially the entire length thereof;

said reel bat having at least one forwardly presented ridge created by the presence of said at least one reinforcing member;

an upper and lower ridge projecting forwardly from each reel bat front surface, parallel to said at least one ridge created by the reinforcing member;

means for removably securing each said reel bat between at least a pair of said reel arms with the back surface of the bats abutting a forward face of the reel arms; and

said means for removably securing said bats including:

an elongated spacer member extending transversely across the front surface of said bat, with depressions therein adapted to receive said upper and lower ridges and the at least one ridge created by the reinforcing member, and

connector means for removably connecting said bats between said reel arms and spacer members.

5,024,051

BOLTED DOUBLE SICKLE CUTTERBAR

Emmett F. Glass, Akron; Ernest A. Schoeneberger, and Stanley J. Makofka, both of New Holland, all of Pa., assignors to Ford New Holland, Inc., New Holland, Pa.

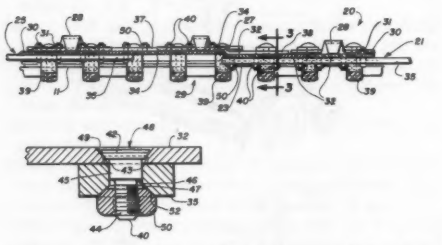
Filed Jul. 2, 1990, Ser. No. 547,710
Int. Cl.[5] A01D *34/14*
U.S. Cl. 56—297 15 Claims

10. A fastener for attaching an overlap sickle section to a support bar of a double sickle reciprocating cutterbar, comprising:

a head portion forming one end of said fastener and being engageable with said overlap knife section having a hole

therethrough adapted to permit said head portion to be countersunk into said overlap knife section;

a threaded portion forming the opposing end of said fastener and being adapted for engagement with a nut to effect a clamping of said overlap knife section and said support bar between said head portion and said nut, thereby detachably affixing said overlap knife section to said support bar; and



an intermediate portion positioned between said head portion and said threaded portion and having a non-circular cross-sectional configuration, said intermediate portion being smaller than the hole through said overlap knife section so that said intermediate portion can pass through said overlap knife section to be engageable with a corresponding opening through said support bar such that said fastener is restricted from rotating relative to said support bar when engaged therewith.

5,024,052

APPARATUS FOR HARVESTING BERRIES ON LOW PLANTS

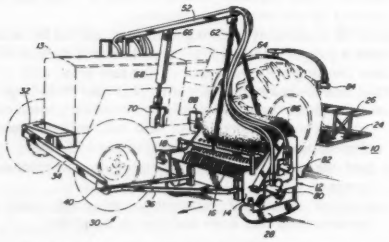
R. D. Bragg, and H. Lloyd Weatherbee, both of Collingwood, Nova Scotia, Canada, assignors to Doug Bragg Enterprises Ltd., Canada

Continuation-in-part of Ser. No. 753,524, Jul. 10, 1985, Pat. No. 4,862,683. This application May 23, 1988, Ser. No. 197,311

The portion of the term of this patent subsequent to Sep. 5, 2006, has been disclaimed.

Int. Cl.[5] A01D *45/22*

U.S. Cl. 56—330 **5 Claims**



1. Apparatus for harvesting berries on low plants especially strawberries comprising: a picking head including a frame movable along the ground over the crop of berries in a path of travel and a reel mounted on the frame for rotation about an axis transverse to the circumferentially spaced rows of tines thereon adapted to move and to enter into the berry plants and to engage the berries and to strip them from the plants, cam means for moving said tines relative to said reel to facilitate the stripping action and to facilitate deposit of the berries into the reel, conveyor means to carry the berries outwardly of the reel and thence into a container, and wherein said reel is rotated in a direction such that free end portions of those tines closest to the ground point in the forward direction of harvester travel, with the cam means and the tine shapes being selected to that, during use, at least said free end portions of the tines can travel generally parallel to the ground for a relatively extended distance to assist in recovery of berries lying close to the ground and further including a main rotary brush and drive means therefor for engaging said tines and removing debris therefrom adjacent an upper portion of the path of tine travel, and auxiliary brush means located in advance of the main brush means for engaging the successive rows of tines and sweeping away any berries that cling to the outside portions of the tines to sweep them inwardly so that they may be caught by the next following set of tines and then deposited into the conveyor means.

5,024,053

AGRICULTURAL MACHINE HAVING AT LEAST ONE ROTOR FOR MOVING PRODUCTS LOCATED ON THE GROUND

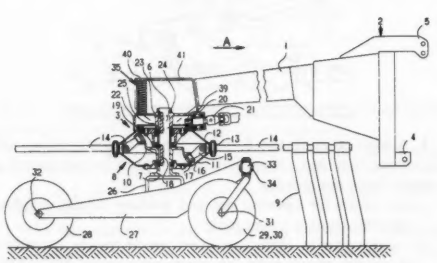
M. Jerome Aron, Dossenheim - sur - Zinsel, France, assignor to Kuhn S.A., Saverne, France

Filed Mar. 15, 1990, Ser. No. 493,825

Claims priority, application France, Mar. 20, 1989, 89 03804

Int. Cl.[5] A01D *78/10*

U.S. Cl. 56—367 **14 Claims**



1. Agricultural machine movable in a direction of advance and having a frame adapted to be hooked to a drive tractor, said agricultural machine comprising:

at least one rotor having work tools attached thereto for moving products located on the ground and comprising a control cam for controlling said tools, said at least one rotor being connected to the frame by a hinge pin located at its upper part, said pin being substantially perpendicular to the direction of advance of the machine, said rotor further comprising a central support pin guided in rotation in said rotor so that it can turn at least 180° around its longitudinal axis, said control cam being fixed on said central support pin;

at least one front and at least one rear carrying wheels positioned on at least two lines offset with respect to one another in the direction of advance of the machine, wherein said carrying wheels are connected to the central support pin and move on the ground during work; and

a pair of actuating means positioned between said frame and said central support pin for acting one or the other on said support pin as a function of the direction of advance of the machine to make said rotor pivot around said hinge pin, wherein, in a work position, a load supported by at least one of said front wheels, relative to the direction of advance, is decreased and at least one of the rear wheels, relative to the direction of advance, is pushed to the ground.

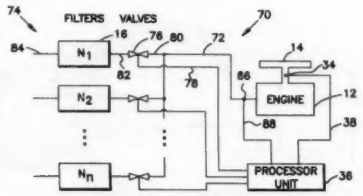
5,024,054
ENGINE EXHAUST SYSTEM WITH SEQUENTIAL LOADING OF MULTIPLE FILTERS

Marty A. Barris, Lakeville, and Wayne M. Wagner, Apple Valley, both of Minn., assignors to Donaldson Company, Inc., Minneapolis, Minn.

Continuation of Ser. No. 456,334, Dec. 26, 1989, abandoned. This application Oct. 31, 1990, Ser. No. 607,601

Int. Cl.[5] G01N *3/02*

U.S. Cl. 60—274 **9 Claims**



1. A method of selecting among multiple filters for placement in an exhaust stream of an engine for loading with particulates and for removal from said stream for regeneration, comprising the steps of:

placing a first filter in said stream;

sensing backpressure in said stream between said filter and said engine;

placing a second filter in said stream when said backpressure is greater than a first predetermined value;

sensing air flow to said engine;

removing said second filter from said stream when said air flow is less than a second predetermined value.

5,024,055
DEVICE FOR DETECTING COMBUSTION CONDITIONS IN COMBUSTORS

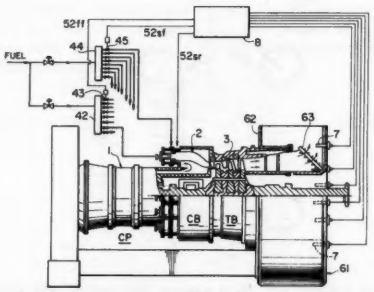
Isao Sato; Seiichi Kirikami; Akira Shimura; Fumiyuki Hirose; Hiroshi Inose; Haruo Urushidani, and Osamu Arai, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 4, 1989, Ser. No. 389,746

Claims priority, application Japan, Aug. 9, 1988, 63-198622

Int. Cl.[5] F02C *9/16, 9/28*

U.S. Cl. 60—39.27 **10 Claims**



1. A device for detecting combustion conditions in a plurality of combustors in a gas-turbine apparatus including said combustors and a gas turbine driven by combustion gas from said combustors, said device comprising:

means disposed on a downstream side of said gas turbine for measuring a concentration of at least one unburnt component in said combustion gas;

means for obtaining a distribution pattern of said measured concentration; and

means for examining said obtained distribution pattern to detect combustion conditions in said combustors.

5,024,056
DUAL-CIRCUIT BRAKE BOOSTER

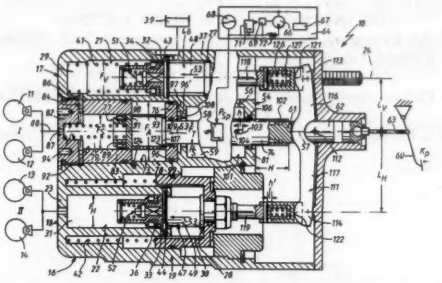
Milorad Zivkovic, Filderstadt, Fed. Rep. of Germany, assignor to Daimler-Benz, Fed. Rep. of Germany

Filed Dec. 19, 1988, Ser. No. 286,079

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1987, 3743190

Int. Cl.[5] B60T *13/12*

U.S. Cl. 60—550 **12 Claims**



1. A brake apparatus for the pressure supply of brakes of a hydraulic two-circuit brake installation of a road vehicle, comprising two static brake circuits, outlet pressure spaces, the static brake circuits being operatively connected with respective ones of the outlet pressure spaces, brake force servo means including servo-piston means, two master cylinder pistons associated with respective ones of the two circuits, a brake pressure build-up taking place in said outlet pressure spaces as a result of displacement in the same direction of the servo-piston means and of the master cylinder pistons, the servo-piston means experiencing a pressure build-up displacement only when the brake force servo means operates properly, and the master cylinder pistons experiencing a pressure build-up displacement when the brake force servo means is operable and inoperable in which case an increase of the piston displacement travel and a pressure value correlated therewith occurs in relation to a predetermined magnitude of an actuating acting force engaging at the master cylinder pistons, the servo-piston means including an annular piston with a central opening, a plunger piston extending through the annular piston in the axial direction and being displaceable pressure-tight in the central opening, the plunger piston including an entrainment flange, the annular piston being urged into unilateral abutment with the entrainment flange of the plunger piston by pressure actuation of an actuation surface of the annular piston with an outlet pressure of the brake force servo means, the plunger piston being coupled for movement with a force transmitting means for introducing a component of the actuating force resulting from pedal actuation in the sense of a pressure build-up displacement to act on the master cylinder pistons, the master cylinder pistons being of twin-type construction and arranged in a common housing with their central longitudinal axis extending substantially parallel to one another, the brake force servo means being arranged between the two master cylinder pistons with its central axis extending parallel to the master cylinder piston axes, the force transmission means including a moment-compensated rocker means for the transmission both of the pedal force and of an auxiliary force produced by the brake force servo means, the rocker means being pivotally supported at a pressure member displaceable in the axial direction about an axis perpendicular to the axial plane, and the plunger piston being operatively coupled for movement with the pressure member by a control piston which is axially displaceable relative to the plunger piston within a range limited to a small fraction of the maximum pressure build-up stroke of

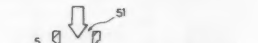
the master cylinder pistons, said range being at least approximately equal to a closing stroke of central valves operatively arranged in a base position of respective ones of the two master cylinder pistons such that the outlet pressure spaces associated with the respective ones of the master cylinder pistons are communicatingly connected with follower spaces thereof, and the rocker means including rocker arms which are supported by a respective support spring operatively connected with respective ones of the two master cylinder pistons, wherein the support springs have a spring travel also approximately about equal to the closing stroke of the central valves.

5,024,057

EXHAUST-DRIVEN ELECTRIC GENERATOR SYSTEM FOR INTERNAL COMBUSTION ENGINES

Hideo Kawamura, Samukawa, Japan, assignor to Isuzu Motors Limited, Tokyo, Japan

Filed Jun. 23, 1989, Ser. No. 370,877
Claims priority, application Japan, Jun. 29, 1988, 63-161773
Int. Cl.[5] F01D *15/10*
U.S. Cl. 60—597 **8 Claims**



1. An electric generator system drivable by the energy of exhaust gases emitted from an internal combustion engine, comprising:

two turbines drivable by the energy of exhaust gases from the internal combustion engine, said turbines having respective turbine scrolls;

a turbine shaft interconnecting said two turbines;

an electric generator mounted on said turbine shaft;

first and second exhaust gas inlet pipes having ends connected respectively to said turbine scrolls and having other ends adapted to be connected to an exhaust pipe of the internal combustion engines;

switching means for controlling communication between said first and second exhaust gas inlet pipes and the exhaust pipe of the internal combustion engine;

detecting means for detecting the rotational speed of said turbine shaft; and

control means for controlling said switching means based on a detected signal from said detecting means.

5,024,058

HOT GAS GENERATOR

Jack R. Shekleton, San Diego, and Robert W. Smith, Lakeside, both of Calif., assignors to Sundstrand Corporation, Rockford, Ill.

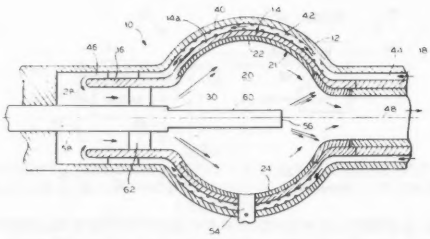
Filed Dec. 8, 1989, Ser. No. 447,654
Int. Cl.[5] F02C *3/14*
U.S. Cl. 60—752 **21 Claims**

1. A hot gas generator, comprising:

a vessel having a wall defining narrow, spaced apart inlet and outlet ends interconnected by a relatively wide combustion chamber;

a liner positioned within said wall so as to be disposed substantially entirely about said combustion chamber, said liner being positioned relative to said wall to define means for controlling heat transfer from said combustion chamber through said liner and said wall, said heat transfer controlling means being adapted to limit stress on said liner through a preselected temperature range;

said heat transfer controlling means including a relatively uniform gap between said wall and said liner for controlling heat transfer from said combustion chamber through



said liner and said wall entirely throughout said preselected temperature range, said liner being adapted to thermally expand under heat to close said gap at a preselected temperature with said gap being selected to accommodate thermal outward expansion of said liner in a manner producing relatively little stress thereon;

an oxidant inlet port at said inlet end of said wall; and

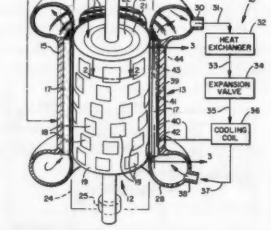
a fuel discharge port for directing fuel into said combustion chamber.

5,024,059

ELECTRONIC FORCE IONIZED GAS AIR CONDITIONING SYSTEM COMPRESSOR

Jerry D. Noble, 883A Dublin, Richardson, Tex. 75080

Filed Jun. 20, 1990, Ser. No. 540,762
Int. Cl.[5] F25B *21/00*
U.S. Cl. 62—3.1 **20 Claims**



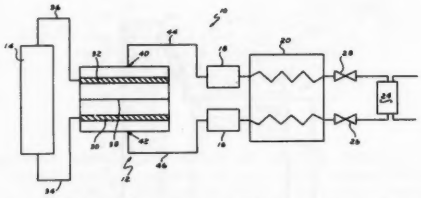
1. An ionized gas drive system comprising: gas passage means; multiple magnet elements mounted in a rotational carrier with the multiple magnet elements mounted in mutually spaced relation and in common polarity; drive means connected to drive said rotational carrier in rotation; a magnetic circuit with a gap through which said gas passage means extends substantially at right angles to the rotational direction of said rotational carrier and movement of the magnetic field lines of force emanating from common poles of the multiple magnet elemets and extended through the gap of the magnetic circuit.

5,024,060

JOULE-THOMSON REFRIGERATION CYCLE EMPLOYING A REVERSIBLE DRIVE ELECTROCHEMICAL COMPRESSOR

Raymond B. Trusch, South Windsor, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jun. 27, 1990, Ser. No. 544,551
Int. Cl.[5] F25B *19/02*
U.S. Cl. 62—51.2 13 Claims



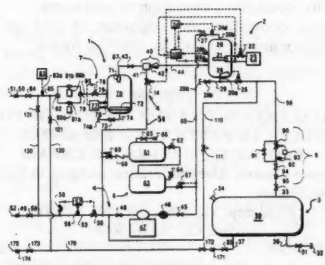
1. A refrigeration cycle comprising: an electrochemical compressor having a low-pressure side, a high-pressure side and an electrolyte membrane between the low-pressure side and the high-pressure side; a working fluid having an electrochemically active component and a condensable component; a reverse-polarity power source for driving the electrochemical compressor for receiving working fluid at the low-pressure side, compressing the working fluid and delivering the compressed working fluid to the high-pressure side; a first regenerable sorbent bed downstream of the high-pressure side for receiving the compressed working fluid from the compressor and absorbing the condensable component therefrom; a second regenerable sorbent bed upstream of the low-pressure side for replacing the condensable component into the working fluid prior to the working fluid being fed to the low-pressure side of the compressor; a heat exchanger located between the first and second regenerable sorbent beds; a first thermal expansion means provided between the first regenerable sorbent bed and the heat exchanger; a second thermal expansion means provided between the second regenerable sorbent bed and the heat exchanger; and means for selectively reversing the polarity of the power source and correspondingly the flow of working fluid through the refrigeration cycle, thereby insuring that the electrolyte membrane is constantly wetted by the condensable component.

5,024,061

RECOVERY PROCESSING AND STORAGE UNIT

Richard A. Pfeil, Jr., Arlington, Va., and Charles M. Pirrera, Perry Hall, Md., assignors to Terrestrial Engineering Corporation, Arlington, Va.

Filed Dec. 12, 1989, Ser. No. 448,812
Int. Cl.[5] F25B *45/00*
U.S. Cl. 62—77 110 Claims



1. A refrigerant recovery processing and storage unit, said unit recovering refrigerant fluid from a refrigeration system, said unit comprising:

a gas motivating and pressurizing means for supplying pressurized motivating gas to an inlet of a refrigeration system and for creating a substantial vacuum at an outlet of the refrigeration system, said motivating gas flowing through the refrigeration system due to the pressure difference between the inlet and the outlet and forcing refrigerant to flow from the outlet,

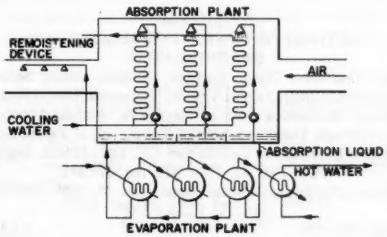
and a storage means for storing the refrigerant fluid.

5,024,062

MULTISTAGE ISOTHERMAL AIR DEHUMIDIFICATION

Lars G. Hellman, Norrtullsgatan 10, S-113 27 Stockholm, Sweden

PCT No. PCT/SE88/00555, § 371 Date May 16, 1990, § 102(e) Date May 16, 1990, PCT Pub. No. WO89/04713, PCT Pub. Date Jun. 1, 1989
PCT Filed Oct. 21, 1988, Ser. No. 488,019
Claims priority, application Sweden, Nov. 20, 1987, 8704598
Int. Cl.[5] F25D *17/06*
U.S. Cl. 62—92 4 Claims



1. A process for conditioning a gas containing the vapors of a volatile substance, which comprises:

placing a gas, containing the vapors of a volatile substance, sequentially in contact with successively more concentrated solutions of an absorption liquid on cooled surfaces, such absorption liquid consisting of a solution of said volatile substance and at least one non-volatile substance,

isothermally absorbing the vapors in the gas into the absorption liquid upon such contact, thereby diluting the concentration of the absorption liquid,

concentrating the diluted absorption liquid by multi-stage evaporation in a multi-stage evaporate, and

recycling the concentrated absorption liquid back to the cooled surfaces.

5,024,063

BRANCHED GAX ABSORPTION VAPOR COMPRESSOR

Donald C. Erickson, 1704 S. Harbor La., Annapolis, Md. 21401

Filed May 11, 1990, Ser. No. 521,994
Int. Cl.[5] F25B *15/00*
U.S. Cl. 62—101 17 Claims

12. A thermally activated process for at least one of compressing a vapor, heating, and cooling comprising:

a) absorbing said vapor into a circulating absorbent liquid over an absorbing temperature range,

b) cooling the absorbent liquid in the lower temperature portion of said absorbing step with an external source of cooling;

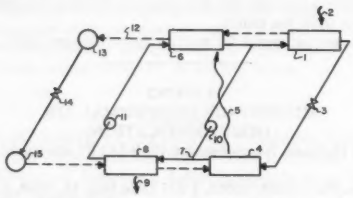
c) desorbing compressed vapor from said circulating absorbent liquid over a desorbing temperature range;

d) heating the absorbent liquid in the higher temperature portion of said desorbing step with an external source of heating;

e) heating the absorbent liquid in the lower temperature portion of said desorbing step and cooling the absorbent

liquid in the higher temperature portion of said absorbing temperature range by exchanging heat there-between;

f) circulating a major fraction of a liquid absorbent comprised of absorbent component and condensed vapor sequentially through all of both of said absorbing and desorbing steps; and



g) circulating a minor fraction of said liquid absorbent between only the higher temperature portion of said absorbing step and the higher temperature portion of said desorbing step, whereby the amount of absorbent component circulated to those portions exceeds that circulated to the remaining portions.

5,024,064

METHOD OF OPERATING ADSORPTION REFRIGERATOR

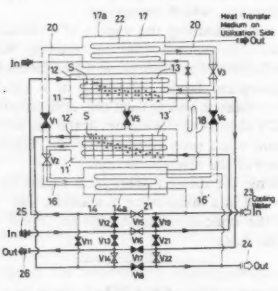
Yasuo Yonezawa, Nara; Toshiya Ohnishi, Sakai; Shin-ichi Okumura, Ohtsu; Akiyoshi Sakai, Toyonaka; Hiroki Nakano; Masao Matsushita, both of Neyagawa; Atsushi Morikawa, and Motoshi Yoshihara, both of Yawata, all of Japan, assignors to Nishiyodo Air Conditioner Co., Ltd., Osaka, Japan

Filed Feb. 14, 1990, Ser. No. 479,942

Claims priority, application Japan, Feb. 28, 1989, 1-48735

Int. Cl.[5] F25B *17/00*

U.S. Cl. 62—106 **6 Claims**



1. A method of operating an adsorption refrigerator comprising two adsorption columns each housing therein a solid adsorbent and heat transfer tubes and sealed with a refrigerant, a condenser, an evaporator, and paths for refrigerant interconnecting the adsorption columns to the condenser and the evaporator so that the refrigerant may be circulated through the adsorption columns, which method comprises changing over periodically alternately adsorption and desorption phases between the adsorption columns in such a manner that the one adsorption column and the other adsorption column are at mutually different phases and that a heat transfer medium on a heat source side and a coolant are alternately routed through the heat transfer tubes of the one adsorption column and the other adsorption column in response to desorption and adsorption phases; and further comprises, shortly before one cycle of an adsorption and a desorption phases is terminated, shutting off the paths for refrigerant; further advancing the adsorption and desorption phases between the adsorption columns while continuing to supply the heat transfer medium and the coolant, thereby to finish the cycle of adsorption and desorption phases; and subsequently changing-over to a next cycle of just opposite phases.

5,024,065

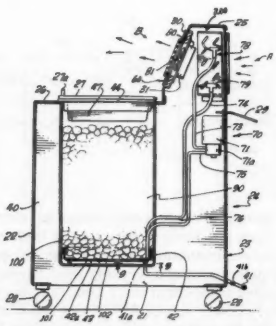
AIR CONDITIONING SYSTEM FOR CONFINED SPACES

David D. Barrett, P.O. Box 9516, Pompano Beach, Fla. 33075

Filed Mar. 13, 1986, Ser. No. 839,221

Int. Cl.[5] F25D *3/02*

U.S. Cl. 62—285 **7 Claims**



1. An apparatus for cooling a confined space such as within a closed surveillance vehicle which does not betray the cooling operation within the vehicle through noise, electronic emission or liquid dripping comprising:

a cabinet having a front wall, a pair of side walls and a rear wall;

an ice and water containing chamber within said cabinet insulated from said cabinet walls;

a pan including heat conducting material having a multiplicity of fluid conduits, said pan mounted in the adjacent floor area of said chamber, said fluid conduits disposed within said ice and water containing chamber so that said fluid conduits are substantially surrounded by ice and water within said ice containing chamber thereby efficiently cooling said fluid conduits in said pan and cooling fluid within said fluid conduits;

an intake conduit and an outlet conduit connected to said pan fluid conduits;

a pump for circulating a fluid connected to said outlet conduit;

a heat exchanging radiator unit connected to said inlet conduit;

second fluid conduit connected to said pump and said radiator;

means to draw air through said radiator unit and pass it into the confined space within said surveillance vehicle;

said cabinet including a radiator housing means, said radiator being mounted within said radiator housing means;

means for storing food within said ice and water chamber;

means for controlling operation of said pump;

means for controlling the operation of said air drawing means connected to said air drawing means.

5,024,066

INSTALLATION FOR THE MAKING OF FOOD PRODUCTS, IN PARTICULAR EXPANDED FOOD PRODUCTS, SUCH AS ICE CREAM

Jean-Jacques Goavec, Alencon, France, assignor to Goavec S.A., Alencon, France

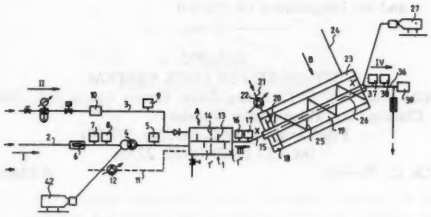
Filed Sep. 22, 1988, Ser. No. 247,919

Int. Cl.[5] A23G *9/20*

U.S. Cl. 62—306 **24 Claims**

1. An installation for the making of food products, in particular expanded food products such as ice cream, comprising a

freezing system (B) to cool and homogenise the product before transportation to a packing system, this freezing system being made up of a cylindrical chamber forming a double-casing, inside which a refrigerating fluid circulates, and agitating means, which is mounted for rotation inside the cylinder, the



installation characterized in that the agitating means in the cylindrical chamber comprises an Archimedes' screw (25) the surface of which is grained and which is provided on its periphery with scraper knives (32) aligned in a longitudinal direction of the screw and touching an internal surface of the cylindrical chamber.

5,024,067

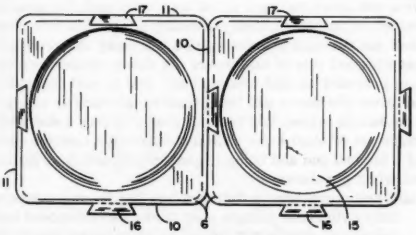
FIT AND COOL BEVERAGE CONTAINER

Simeon E. Maier, II, 1750 92nd St., Caledonia, Mich. 49316

Filed Aug. 30, 1989, Ser. No. 400,805

Int. Cl.[5] F25D *3/08*

U.S. Cl. 62—457.4 **1 Claim**



1. A beverage container cooler comprising a shell constructed of plastic comprising an inner and outer wall, a liquid contained in the space between the inner and outer wall adapted to be frozen prior to use, A circular opening in the shell of a size to contain a beverage container, the exterior of said shell having four sides of equal length in the shape of a square, two of the adjoining sides containing a recessed dovetail joint slot and the other two adjoining sides containing protruding dovetails joints so that similar containers can be easily connected and removed.

5,024,068

NEEDLE PICKER RELEASING DEVICE

Borivoj Fucík, Markvartice; Milan Petránek, Starec, and Frantisek Smítal, Trebic, all of Czechoslovakia, assignors to Elitex Koncern Textiln, Liberec, Czechoslovakia

Filed Oct. 5, 1988, Ser. No. 254,345

Claims priority, application Czechoslovakia, Oct. 6, 1987, 7169-87

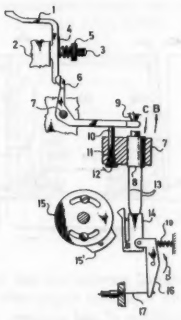
Int. Cl.[5] D04B *9/20*

U.S. Cl. 66—53 **2 Claims**

1. Needle picker releasing device in a circular knitting machine for the production of hosiery goods and the like said device for the releasing of a needle picker from a non-operative into operative position, comprising

an electromagnet kinematically connected with the picker so that energizing the electromagnet changes the position of blocking means to release the picker to allow rocking motion;

a microswitch for energizing said electromagnet, said microswitch being actuated by a rotating cam;



said microswitch being mounted on a switch lever such that said microswitch is movable into and out of a path of said cam.

5,024,069

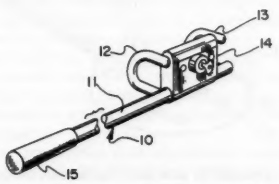
ANTI-THEFT LOCKING APPARATUS FOR STEERING WHEELS

Edwin J. Hull, Jr., 1652 Sheridan Rd., South Euclid, Ohio 44121, and Charles R. Johnson, 55 S. Chillicothe, Aurora, Ohio 44202

Filed Aug. 16, 1990, Ser. No. 568,216

Int. Cl.[5] B60R *25/02*

U.S. Cl. 70—209 **9 Claims**



1. A lock apparatus for locking the steering wheel of a vehicle and limiting its rotation, said apparatus comprising: an elongate member; hook means fixedly secured to the elongate member for extending around a portion of the steering wheel of an automobile, said hook means extending transversely of the elongate member; locking means for cooperating with the hook means to secure the elongate member to the steering wheel, said locking means being pivotally mounted on the elongate member and being movable to a first position where it cooperates with a hook means and away from the first position to release the steering wheel, the axis of rotation of the locking means being disposed longitudinally of the elongate member.

5,024,070

LOCK MOUNTING PAD

George F. Toledo, Fall Brook, Calif., assignor to Thomas Industries, Inc., Los Angeles, Calif.

Filed Mar. 8, 1990, Ser. No. 490,443

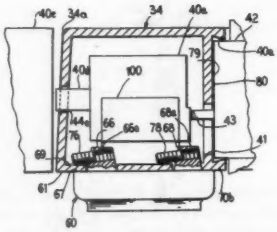
Int. Cl.[5] E05B *9/08*

U.S. Cl. 70—370 **23 Claims**

1. A locking system for use with a door having a door stile with a wall defining an exterior surface and an interior surface

planarly parallel to said exterior surface with at least one aperture extending through said wall, and a passage through a lateral face of said door stile, said lateral face being perpendicular to said exterior surface, comprising:

a mounting pad comprising a body having at least one anchor portion projecting therefrom and extending through said aperture;



at least one rotational member carried by said anchor portion and having a portion engageable with said interior surface upon rotation of said member, to clamp said body against said wall, said member rotated by insertion of a tool into said passage.

5,024,071

CODING ASSEMBLY FOR LOCKLIKE DEVICES

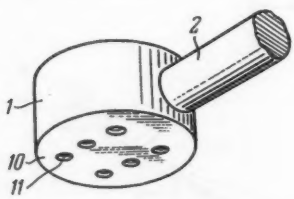
David I. Shafirkin, ulitsa Egerskaya, 5, korpus 1, kv. 110, Moscow, U.S.S.R.

Filed Nov. 1, 1989, Ser. No. 430,530

Claims priority, application U.S.S.R., Oct. 14, 1988, 4493189

Int. Cl.[5] E05B *35/04*

U.S. Cl. 70—387 **10 Claims**



1. A coding assembly of a locklike device, comprising:

a body;

a main cavity in said body;

additional cavities in said body, communicating with said main cavity, the axis of each of said additional cavities being perpendicular to the longitudinal axis of said main cavity;

securing pins, each of which is arranged for limited longitudinal displacement in each of said respective additional cavities, and wherein each of said securing pins moves within said respective additional cavities by gravity;

coding recesses, each of which is provided in the side surface of the respective one of said securing pins;

a removable cross bar;

a homing head of said cross bar designed to be received in said main cavity of said body and to interact with said securing pins;

at least one longitudinal rib provided on the side surface of said homing head and having a cross-sectional profile corresponding to the cross-sectional profile of said coding recesses, the depth of which corresponds to the height of said longitudinal rib;

at least one additional recess provided in the side surface of each of said securing pins and having a cross-sectional profile corresponding to the cross-sectional profile of said longitudinal rib, the depth of each additional recess being smaller than the height of said longitudinal rib;

a key;

coding pins of said key, designed to interact with said securing pins and to allow free movement of said homing head out of said body owing to their location in one plane passing through the longitudinal axis of said homing head and the longitudinal rib thereof.

5,024,072

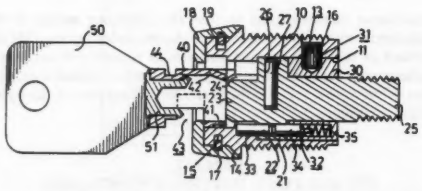
TUMBLER PIN LOCK SYSTEM

Miko Lee, No. 5, Li Hsing Lane, Chung Cheng Rd., Hsin Chuang City, Taipei Hsien, Taiwan

Filed Aug. 28, 1990, Ser. No. 573,701

Int. Cl.[5] E05B *19/02, 27/08*

U.S. Cl. 70—491 **4 Claims**



1. A tumbler pin lock system for computers comprising a lock mechanism and a key, said lock mechanism comprising an outer tubular casing mounted to a frame of said computer, said tubular casing having an eccentric through hole for rotatably receiving a locking spindle, said locking spindle comprising a driver pin sleeve having a set of bore holes each for receiving a driver pin, a rotating shaft protruding from a first side of said driver pin sleeve, a protrusion with a keyway slot protruding from a second side of said driver pin sleeve, a tumbler sleeve being provided on said rotating shaft next to said first side of said driver pin sleeve and being fixed to said tubular casing by an anchoring means, said tumbler sleeve having a distributed annular set of blind holes each for receiving a tumbler spring and a tumbler pin and being alignable with said bore holes in said driver pin sleeve;

said key comprising a flattened key handle and a substantially cylindrical portion, a set of annularly disposed semi-cylindrical slots being formed on an outer periphery of a first end of said cylindrical portion, each of a proper depth to engage with corresponding driver pins disposed in said bore holes in said driver sleeve, a key guide lug being formed inside said set of semi-cylindrical slots to engage with said keyway slot to rotate said rotating shaft relative to said tumbler sleeve to provide a locking or unlocking function, a cutout portion being formed in a middle portion of said cylindrical portion, a groove being formed in an outer periphery of a rear portion of said cylindrical portion, a retaining flange being on an inner peripheral wall of said cylindrical portion for attaching an engaging piece of said flattened key handle in said cylindrical portion to form a complete key.

5,024,073

BEZEL LOCK, KEY AND RECEIVER ASSEMBLY

Russell M. Lloyd, York, Pa., assignor to Rusken Machine & Tool Service, York, Pa.

Filed Jan. 16, 1990, Ser. No. 465,315

Int. Cl.[5] E05B *27/00*

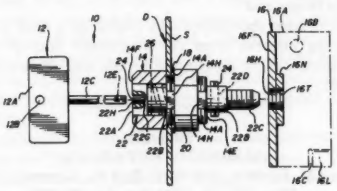
U.S. Cl. 70—491 **17 Claims**

1. A lock assembly, comprising:

a. a lock body having a hole longitudinally therethrough;

b. a plunger arranged longitudinally in the hole through the lock body, said plunger having a head portion and a rear portion;

c. a single spring means, coiled around the plunger and arranged longitudinally in the hole inside the lock body, for pushing the head portion of the plunger so that the plunger is pulled back into the lock body to an open position;



d. key means, engagable with the head portion of the plunger, for turning the plunger to a closed position; and

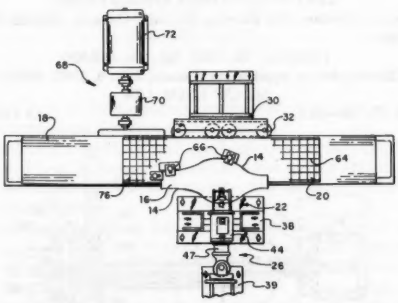
e. plate means, engagable with the rear portion of the plunger, for receiving the rear portion of the plunger in the closed position.

5,024,074

APPARATUS AND METHOD FOR SELECTIVELY FORMING A THICKENED EDGE ON A PLATE OF FORMABLE MATERIAL

Dennis L. Blunier, Danvers; Phillip J. Shankwitz; Maurice L. Caudill, both of Peoria; Ronald C. Bowar, Chillicothe, and Dwight E. Aussieker, Varna, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed May 19, 1989, Ser. No. 354,187
Int. Cl.[5] B21D *19/00, 19/04*
U.S. Cl. 72—16 **20 Claims**



1. A method of forming a thickened edge on a plate of formable material having a non-linear edge by working the non-linear edge of the plate into a prescribed thickness and shape, comprising:

holding the plate and engaging the non-linear edge of the plate with a forming apparatus;

applying force to the forming apparatus in one direction toward the non-linear edge and in a magnitude sufficient to form the thickened edge;

moving the plate and the forming apparatus transversely relative to each other in a direction cross-wise of the one direction; and

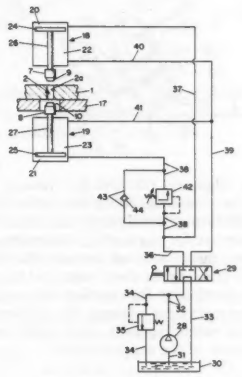
sensing the non-linear edge and varying the force placed against the non-linear edge applied by the forming apparatus so that the magnitude thereof is substantially constant in a direction perpendicular to the non-linear edge of the plate to form a generally uniform thickened edge.

5,024,075

METHOD OF DEFORMING TWO OPPOSITE EDGES OF A SINGLE WORKPIECE BY MACHINING, AND APPARATUS FOR IMPLEMENTING THE METHOD

Charles M. Simonetto, Le Perreux, France, assignor to Rene Tourolle et Fils (Societe A Responsabilite Limitee), France

Filed Jun. 16, 1989, Ser. No. 368,037
Claims priority, application France, Jun. 22, 1988, 88 08394
Int. Cl.[5] B21J *1/06;* **B21D** *19/10*
U.S. Cl. 72—38 **3 Claims**



1. An apparatus for implementing the deformation of two opposite edges of a workpiece by machining, comprising:

a support frame, first and second pressurized fluid actuators mounted thereon in opposed relation, said actuators having a means for supporting and moving a machining tool, whereby the shape of the tool gives each edge a desired final shape by contacting the workpiece, said tools having shapes complementary to said desired deformed shapes for the two edges and wherein said complementary shapes of the tools correspond solely to the deformation zones of the two edges of the workpiece;

a workpiece support separate from the tools;

a source of fluid under pressure for actuating said actuators, said actuators having a working chamber and a retraction chamber for receiving the pressurized fluid and activating said actuators;

a selective pressurized fluid distribution valve connected between the working chambers of the first and second actuators, and the source of fluid under pressure, said working chambers being connected in parallel to the source of fluid under pressure via respective feed ducts so that effective connection of said working chambers via said selective distribution device causes simultaneous translation of the two tools; and

a delivery valve rated to supply fluid when the fluid reaches a predetermined pressure, the delivery valve being located on the feed duct to the working chamber of one of said two actuators, in such a manner that when said effective connection is obtained via the selective distribution device, fluid is initially fed to one of said working chambers and thereafter to both working chambers simultaneously.

5,024,076

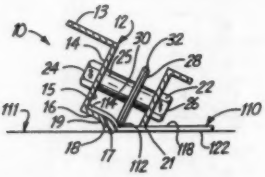
TOOL FOR FORMING SHEET METAL

Richard L. Warner, 17301 Polk St. NE., Anoka, Minn. 55303

Filed Jan. 23, 1989, Ser. No. 299,892
Int. Cl.[5] B21D *5/08, 17/04*
U.S. Cl. 72—211 **15 Claims**

1. A creasing tool for forming a crease line on a workpiece of sheet metal, and the like, and for simultaneously creating a

flange portion on the workpiece extending outwardly from the crease to the perimeter edge of the workpiece by rotation of the tool as it is extended along an edge of the workpiece, comprising: a first half and a second half, and the first half including a handle flange portion extending transversely from an upper end thereof for facilitating the rotating of the tool, and having guide means extending downwardly and transversely from the handle portion for cooperating with a perimeter edge of the workpiece for guiding the creasing tool along



the perimeter edge and the first half having support means integral there with and extending transversely from the guide means in a direction generally opposite from the extension of the handle portion for supporting the workpiece perimeter edge, a creasing means secured between the first half and the second half for creasing the sheet metal and the creasing means having a peripheral edge for creasing the workpiece, and the peripheral edge extending adjacent the support means and the peripheral edge extending through a plane transverse to the plane of extension of the support means.

5,024,077

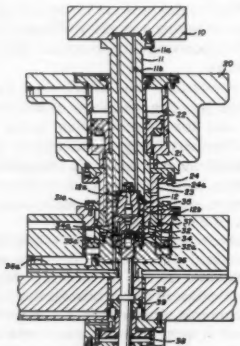
METHOD FOR FORMING CONTAINER WITH PROFILED BOTTOM

Joseph D. Bulso, Jr., Canton, and James A. McClung, North Canton, both of Ohio, assignors to Redicon Corporation, Canton, Ohio

Continuation-in-part of Ser. No. 141,826, Jan. 11, 1988, Pat. No. 4,826,382. This application Apr. 28, 1989, Ser. No. 345,477

Int. Cl.[5] B21D *31/02, 51/44*

U.S. Cl. 72—336 **5 Claims**



1. A method of forming a container body from a supply of material at one forming station, comprising the steps of:

A) forming a blank from the supply of material;

B) drawing an inverted cup from said blank;

C) reverse drawing said inverted cup to form a flanged cup with an overlength sidewall which interconnects a flange with a bottom wall and forming a preliminary profile in the bottom wall of said inverted cup during the reversal; wherein step C includes first advancing a profiled punch against a profile pad supported by a low pressure piston and traveling said punch and said piston together; and second, engaging said low pressure piston with a high pressure piston disposed beneath said low pressure piston and continuing travel of said punch and said pistons to form the preliminary profile while holding pressure on the cup flange and

D) reforming the preliminary profile to a final profile by rolling material from the overlength sidewall into the bottom wall to deepen the profile and shorten the sidewall.

5,024,078

MAGNETIC KEY CHAIN

Lawrence M. Fenwick, 514 North East St., Kewanee, Ill. 61443

Filed Feb. 26, 1990, Ser. No. 484,508

Int. Cl.[5] A47G *29/10*

U.S. Cl. 70—456 R **1 Claim**

1. A magnetic key ring comprising a body of plastic material in which magnetic particles are embedded and formed into a three dimensional shape of an animal or other device and formed with one side which is substantially planar and a key ring attached to said body of plastic material, and including a metallic cover member which has the same configuration as said body of plastic mate rial into which said body of plastic material is received.

5,024,079

TEST PLUG FOR FLANGED PIPES

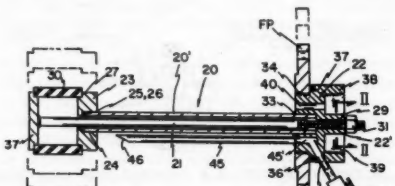
Mario C. Dufort, 308 Eureka, Petrolia, Ontario, Canada N0N 1R0

Filed Apr. 12, 1989, Ser. No. 338,936

Claims priority, application Canada, Jun. 8, 1988, 568992

Int. Cl.[5] G01M *3/04*

U.S. Cl. 73—49.8 **11 Claims**



1. A test plug for proving the integrity of an annular weld of a pipe having an inner wall that sealingly attaches an annular flange, defining bolt accommodating apertures, comprising:

(a) a barrel defining a core channel and having a distal end and a proximate end;

(b) an annular pipe attachment member sealingly attached to the proximate end and adapted to seal with said annular flange and having exterior diameter greater than that defined by the barrel, the annular pipe attachment member defining:

(i) a central channel communicating with the barrel core channel;

(ii) first and second channels defined by and communicat-

ing through the annular pipe attachment member at a radius greater than the inner radius of the barrel;

(c) an annulus adapted to mate with the distal end of the barrel and providing a first seal seating means adapted to seal against the inner wall of the pipe to be tested at a predetermined distance from the flange;

(d) a shaft having at its distal end a disk carrying a second seal seating means, adapted to engage a resilient annular seal, the shaft adapted to extend through the barrel and to occupy the central channel and to protrude from the annular pipe attachment member and to provide thereon, at its protruding proximate end, means adapted for connection;

(e) the resilient annular seal adapted to mate with the seating means and the second seal seating means; and

(f) connection means adapted to engage the means adapted for connection and to urge against the annular pipe attachment member and to cause the relative positioning of the annulus and disk so as to flex the resilient seal into sealing engagement with the inner wall of the pipe to be tested.

5,024,080

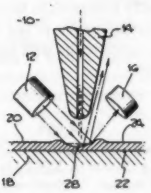
PAINT VISCOSITY MONITORING SYSTEM AND METHOD

Peter G. Backes, Canoga Park, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Apr. 3, 1990, Ser. No. 503,586

Int. Cl.[5] G01N *11/00*

U.S. Cl. 73—54 **17 Claims**



1. A method for measuring the viscosity of a layer of wet paint comprising the steps of:

providing a substrate having a layer of wet paint thereon, said layer of wet paint having an inner surface adjacent to said substrate and an exposed outer surface having an original shape;

applying a deforming force to a predetermined area of the exposed outer surface of said layer of wet paint to depress said outer surface toward said inner surface to form a dimple in said layer of wet paint;

measuring the time required to deform said outer surface to form said dimple; and

determining the viscosity of the layer of wet paint based on said time measured.

5,024,081

LOCATING FLAT SPOTS ON RUBBER WIPE ROLLS

Anthony F. Razauskas, Pasadena, and Marlie A. Duncan, Upperco, both of Md., assignors to The Ward Machinery Company, Cockeysville, Md.

Filed Aug. 20, 1990, Ser. No. 570,016

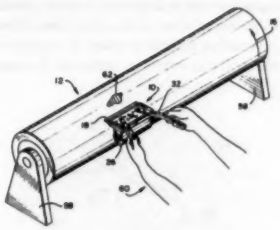
Int. Cl.[5] G01N *19/08*

U.S. Cl. 73—104 **16 Claims**

1. A method of testing a cylindrical surfaced roll for flat spots, comprising the sequential steps of:

applying a liquid film to the cylindrical surface of the roll;

wiping the liquid film off the roll with a blade; and



detecting any flat spot on the cylindrical surface of the roll by observing the presence of any puddle of liquid left on the cylindrical surface after said wiping.

5,024,082

ENGINE-START DISCRIMINATING APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

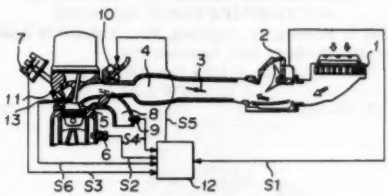
Satoru Ohkubo, and Shoichi Washino, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 13, 1989, Ser. No. 421,031

Claims priority, application Japan, Oct. 24, 1988, 63-267393

Int. Cl.[5] G01M *15/00*

U.S. Cl. 73—117.3 **5 Claims**



1. An engine-start discriminating apparatus which comprises:

a cylinder pressure sensor for detecting a cylinder pressure in an internal combustion engine;

a combustion parameter operating means for extracting a parameter of combustion indicating a state of combustion in the engine on the basis of the output signal of said cylinder pressure sensor; and

a start discriminating means for discriminating the starting of the engine on the basis of the output of the operating means.

5,024,083

TERMINAL FLOW SENSOR

Masanori Inada, and Hichiro Ohtani, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 15, 1989, Ser. No. 451,058

Claims priority, application Japan, Dec. 16, 1988, 63-163900[U]

Int. Cl.[5] G01F *1/68*

U.S. Cl. 73—204.26 **2 Claims**

1. A thermal flow sensor, comprising:

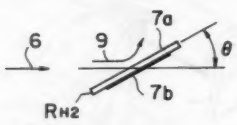
a heat-sensitive resistor disposed in a flow stream of a fluid, said resistor having a planar substrate (7*a*) and a planar heat-sensitive resistor portion (7*b*) whose resistance changes with temperature;

a bridge circuit including said heat-sensitive resistor and a plurality of other resistors; and

a control circuit for controlling said bridge circuit in such a

manner that said bridge circuit maintains a predetermined equilibrium state and for detecting the flow of the fluid from the equilibrium state,

wherein said substrate is disposed at an angle ranging from 20 to 60 degrees relative to the direction of fluid flow, and said heat-sensitive resistor portion is exclusively disposed on a surface of said substrate oriented downstream in the



direction of fluid flow such that said resistor portion is sheltered from the fluid flow by the substrate to attendantly avoid the deposition of dust entrained in the fluid, said thermal flow sensor further comprising a housing allowing the passage therethrough of the fluid, a base (2) provided within said housing for supporting said heat-sensitive resistor, and a fluid temperature sensor provided on said base.

5,024,084

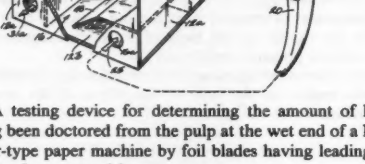
FLOW METER FOR LIQUID DOCTORED THROUGH FOURDRINIER FABRIC AT WET END OF FOURDRINIER PAPER MACHINE

Thomas E. Frawley, Jr., Appleton, Wis., assignor to Appleton Specialty Products, Inc., Appleton, Wis.

Filed Nov. 6, 1989, Ser. No. 432,165

Int. Cl.[5] G01F *1/20*

U.S. Cl. 73—215 **8 Claims**



1. A testing device for determining the amount of liquid having been doctored from the pulp at the wet end of a Fourdrinier-type paper machine by foil blades having leading and trailing edges, comprising:

pick-up means positioned beneath the foil blades of said paper machine, having an opening therein positioned beneath said leading edge of one of said foil blades for collecting some of the liquid being doctored from the pulp, said pick-up means having an opening for catching the liquid being doctored through said Fourdrinier fabric, including means for changing the size of the opening;

a container in liquid communication with said pick-up means;

a weir positioned within said container to divide said container into a collection well upstream from said weir and a discharge well downstream from said weir;

a still well positioned in liquid communication with said collection well; and

sensing means positioned with respect to said still well to sense the level of liquid in said still well.

5,024,085

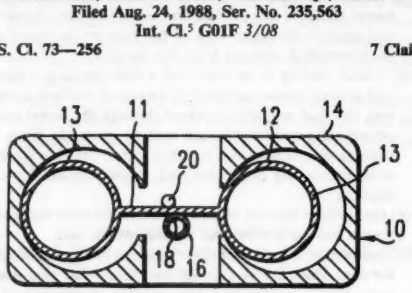
SIGNAL PICKUP MECHANISM

John E. Durand, 26581 Dolorosa, Mission Viejo, Calif. 92691

Filed Aug. 24, 1988, Ser. No. 235,563

Int. Cl.[5] G01F *3/08*

U.S. Cl. 73—256 **7 Claims**



1. In a positive displacement nutating flow meter having a hollow fulcrum supporting a nutator, the nutator including two pistons connected by a barrier, the improvement comprising a magnetic signal pickup mechanism, comprising:

a moving magnetic element mass fixedly coupled to a moving element which moves in response to movement of the nutator and which by moving causes the magnetic element mass to move;

a moveable magnetic element wire coupled magnetically only to the magnetic element mass to track the mass and remain as close as possible to the mass and pass near at least one selected part of the movement path of the mass, wherein one of the mass and the wire is ferro magnetic and the other of the mass and the wire is a permanent magnet sufficiently powerful so that the wire moves as a function of proximate passes of the mass; and

a signal detector coupled to the wire to count selected movements of the wire.

5,024,086

METHOD OF MEASUREMENT OF THE LEVEL OF THE SURFACE OF A METAL BATH

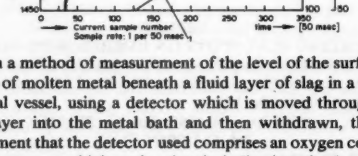
Wilhelmus Heijne, Uitgeest, Netherlands, assignor to Hoogovens Groep B.V., Ijmuiden, Netherlands

Continuation-in-part of Ser. No. 312,877, Feb. 21, 1989, abandoned. This application Jan. 16, 1990, Ser. No. 464,692

Claims priority, application Netherlands, Feb. 26, 1988, 8800491

Int. Cl.[5] G01F *23/22, 23/00*

U.S. Cl. 73—292 **5 Claims**



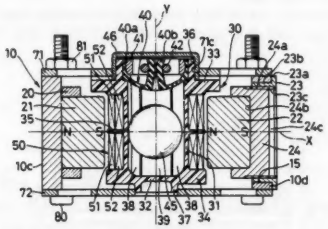
5. In a method of measurement of the level of the surface of a bath of molten metal beneath a fluid layer of slag in a metallurgical vessel, using a detector which is moved through the slag layer into the metal bath and then withdrawn, the improvement that the detector used comprises an oxygen concentration sensor which emits signals indicating the boundary between the molten metal and the slag, whereby the height of said boundary is determined.

5,024,087

ACCELERATION SENSOR

Wataru Nagasaki; Takuro Endo; Susumu Taira, and Hajime Muramatsu, all of Higashimatsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 375,886, Jul. 6, 1989, abandoned. This application Sep. 21, 1989, Ser. No. 410,722
Claims priority, application Japan, Jul. 28, 1988, 63-99151[U]; Sep. 22, 1988, 63-238490
Int. Cl.[5] G01P *15/08*
U.S. Cl. 73—516 R 6 Claims



1. An acceleration sensor comprising:
(a) a tubular casing having one open end and another closed end;
(b) a lid which sealingly closes said open end of said casing so that said casing defines together with said lid an internal sealed space, said lid being made of an elastic material and being fixedly connected at its outer peripheral portion to one end portion of said casing including said open end of said casing, said lid being elastically deformable away from said another end of said casing, and said lid having a tubular portion at said outer peripheral portion of said lid, said tubular portion of said lid being received in said one end portion of said casing, wherein an annular compressing member is received in said tubular portion so that said tubular portion is compressed between said one end portion of said casing and said compressing member;
(c) a damper liquid filled in said sealed space;
(d) a magnetic member movably received within said sealed space;
(e) magnetic force-generating means mounted externally of said casing, a magnetic force generated by said magnetic force-generating means holding said magnetic member in a reference position within said casing, and said magnetic member being displaceable from said reference position against the magnetic force of said magnetic force-generating means when said acceleration sensor is subjected to acceleration; and
(f) detection means mounted externally of said casing for detecting displacement of said magnetic member from said reference position.

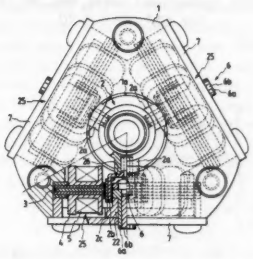
5,024,088

ELECTROMAGNETIC ACCELEROMETER

Fumito Komatsu; Hideo Usuki, and Yuzo Oguchi, all of Nagano, Japan, assignors to K.K. Sankto Seiki Seisakusho, Nagano, Japan

Filed Jun. 20, 1989, Ser. No. 368,622
Claims priority, application Japan, Jun. 20, 1988, 63-151582
Int. Cl.[5] G01P *15/13*
U.S. Cl. 73—517 B 7 Claims

1. An accelerometer for detecting acceleration, comprising:
support means serving as a main support body for said accelerometer;
detection body means provided in and movable relative to said support means upon application of acceleration;
three electromagnet units, each comprising three electromagnets spaced at angles of 120 degrees in a plane, for causing said detection body means to float above said support means, said electromagnet units being combined in the form of a triangular prism;
detection means for detecting the position of said detection body means relative to said support means to generate a detection signal; and



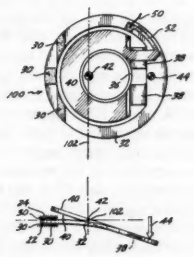
computing means for computing the magnitude and direction of the acceleration exerted upon said detection body means according to said detection signal from said detection means.

5,024,089

STRESS COMPENSATED TRANSDUCER

Brian L. Norling, Mill Creek, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Continuation of Ser. No. 212,785, Jun. 29, 1988, Pat. No. 4,932,258. This application May 8, 1990, Ser. No. 521,836
Int. Cl.[5] G01P *15/08*
U.S. Cl. 73—517 B 11 Claims



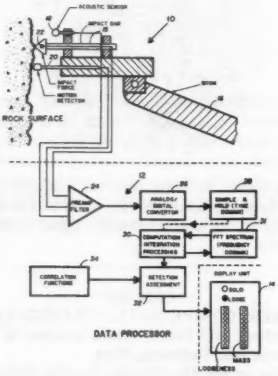
1. A transducer comprising:
(a) a movable proof mass to which is applied a pick-off capacitance plate having a centroid of capacitance;
(b) a support within which the proof mass is mounted, said support including a fixed portion and a cantilevered portion, said proof mass being attached by a compliant cantilever arm to the cantilevered portion of the support and thus movable in a generally transverse direction relative to a plane aligned with a surface of the support;
(c) a stator assembly in which the fixed portion of the support is mounted, the cantilevered portion of the support deflecting around a deflection axis with respect to the stator assembly in response to an imbalanced force acting on the cantilevered portion of the support at a point proximate the compliant cantilever arm, where said imbalanced force has a component in the transverse direction;
(d) a plurality of pads disposed between the stator assembly and the fixed portion of the support, said pads being spaced apart from each other and positioned substantially away from the deflection axis such that the deflection axis is aligned with the centroid of capacitance, whereby displacement of the centroid of capacitance due to deflection of the cantilevered portion by the imbalanced force is substantially prevented.

5,024,090

LOOSE ROCK DETECTOR

Michel J. Pettigrew; David B. Rhodes; Eric G. Lux, and Victor A. Mason, all of Deep River, Canada, assignors to HDRK Mining Research Limited, Copper Cliff, Canada

Filed Sep. 15, 1989, Ser. No. 407,866
Claims priority, application Canada, Sep. 30, 1988, 579030
Int. Cl.[5] G01N *3/30*
U.S. Cl. 73—572 7 Claims



1. A loose rock detector comprising:

a) an impact tool for hitting the rock face;

b) at least one sensor responsive to vibrations generated in the rock and in the impact tool by movement of said impact tool against the face of the rock for generating acoustic signals representative of said vibrations;

c) a data processor responsive to said signals for correlating said signals in the frequency domain against a predetermined relationship to detect loose rocks, said relationship being $F1 \times F2/F3$, where F2 is the sum of the amplitude of the acoustic signals attributed to both the rock and impact tool vibrations in a frequency range of 0–2000 Hz minus the sum of the amplitude of the acoustic signal attributed to impact tool vibration, and F3 is the sum of the amplitude of the acoustic signal attributed to impact tool vibration in a frequency range of 0–5000 Hz; and

d) a display unit for displaying the results of the correlation.

5,024,091

NON-DESTRUCTIVE EVALUATION OF STRUCTURAL MEMBERS

Roy F. Pellerin, Pullman, Wash., and Robert J. Ross, Madison, Wis., assignors to Washington State University Research Foundation, Inc., Pullman, Wash.

Continuation-in-part of Ser. No. 843,717, Mar. 25, 1986, abandoned. This application Jun. 12, 1989, Ser. No. 365,218
Int. Cl.[5] G01N *29/00*
U.S. Cl. 73—597 32 Claims

1. A method for automatically and nondestructively testing a structural member made of nonhomogeneous materials to quantitatively predict at least one mechanical property of the structural member, comprising:

automatically measuring the volume of the structural member to provide a structural member volume measure;

automatically weighing the structural member to provide a structural member weight measure;

automatically calculating density by dividing said structural member weight measure by said structural member volume measure to provide a structural member density measure which is indicative of the approximate density of the structural member;

automatically positioning the structural member into a testing position using a controlled positioning means;

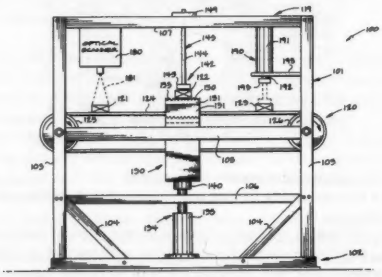
supporting the structural member in said testing position in a manner which provides yieldable mechanical coupling with the structural member;

producing a moving stress wave within the structural member;

measuring a first intensity of the moving stress wave at a first point in time;

measuring a second intensity of the moving stress wave at a second point in time after said first point in time; said stress wave having traversed through the entire structural member at least once;

automatically calculating from said measuring steps to provide at least one stress wave attenuation rate which is



indicative of the approximate rate at which said moving stress wave was attenuated as it traveled through the structural member during a travel period between at least said first and second points in time;

automatically calculating from said measuring steps to provide at least one stress wave velocity measure which is indicative of the approximate velocity of the moving stress wave as it moved through the structural member;

automatically calculating a predicted structural member mechanical property value using said structural member density measure, said at least one stress wave attenuation rate, and said at least one stress wave velocity measure, and predetermined and experimentally-derived parameters which correlate tested values of said mechanical property based upon measures of structural member density, stress wave attenuation, and stress wave velocity.

5,024,092

METHOD AND APPARATUS FOR SELECTIVE TRANSMISSION AND REFLECTION OF SOUND THROUGH A SOLID

Ronald T. Harrold, Murrysville Boro, and Zal N. Sanjana, Mt. Lebanon, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 16, 1990, Ser. No. 568,281
Int. Cl.[5] G01N *9/24*
U.S. Cl. 73—602 34 Claims

1. An apparatus for facilitating the complete transmission of sound waves through an object, the object having at least two walls forming a known distance therebetween, the apparatus comprising:

sound wave detection means affixed to a first wall of the object, the first wall being that which is closest to a source of initial sound waves;

first transducer means affixed to said sound wave detection means, said first transducer means adapted to transform said initial sound waves into electronic signals;

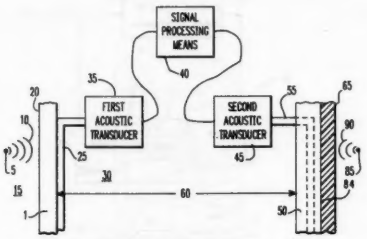
second transducer means for conversion of electronic signals into secondary sound waves;

sound wave emission means affixed to said second transducer means and a second wall of the object, the second wall being opposite said first wall; and

signal processing means, electronically connected to said first and second transducer means, said signal processing means adapted to:

calculate the wavelength of said initial sound waves impinging on said sound wave detection means,

calculate the time necessary to pass a distance one half of



said wavelength minus the known distance between said walls, and

emit an electronic signal to said second transducer means, the electronic signal timed such that it will cause the emission of secondary sound waves of identical wavelength as said initial sound waves from said sound wave emission means at the time calculated.

5,024,093

FAN-SHAPE SCANNING ULTRASONIC FLAW DETECTING APPARATUS

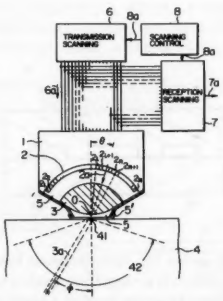
Souji Sasaki; Hirotoshi Kino, both of Hitachi; Yoshinori Musha, Hitachiota; Jun Kubota, and Hisao Okada, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 202,124, Jun. 3, 1988, abandoned. This application Mar. 2, 1990, Ser. No. 489,850

Claims priority, application Japan, Jun. 5, 1987, 62-139788; Nov. 11, 1987, 62-283304

Int. Cl.[5] G01N *9/24*

U.S. Cl. 73—633 **3 Claims**



1. In a fan-shaped scanning flaw detecting apparatus comprising:

a probe provided with an ultrasonic wave transmitting-and-receiving array transducer arranged along a circular arc and an acoustic lens diverging and converting an ultrasonic beam transmitted/received by said array transducer into a substantially parallel beam, said array transducer having a circular arc; and

a scanning function section sequentially switching the transmitting and receiving operation of a group of operative transducer elements of said array transducer so as to make said ultrasonic beam perform fan-shaped scanning, whereby an echo signal from an object to be examined is obtained by the transmitting and receiving operation of said group of operative transducer elements so as to detect a flaw in the object, the improvement comprising:

a flexible material that provides a contact point to an object to be examined;

said acoustic lens being unitary and having a top portion, said top portion of said acoustic lens being convex and being positioned at a center of the circular arc of said array transducer, said acoustic lens being positioned between said array transducer and said flexible material, a surface of said acoustic lens on the side of said array transducer having a shape substantially the same as said circular arc of said array transducer; and

an ultrasonic wave transmitting fluid disposed between said top portion of said acoustic lens and said flexible material, said fluid having an ultrasonic wave velocity less than that of said acoustic lens.

5,024,094

ULTRASONIC IMAGING SYSTEM OF BONDING ZONE

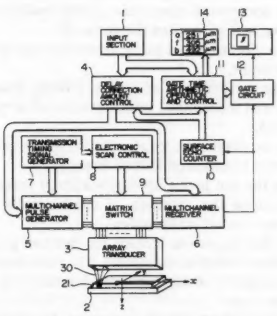
Jun Kubota; Hirotoshi Kino, both of Hitachi; Yosinori Musha, Hitachiota, and Hisao Okada, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 12, 1988, Ser. No. 282,496

Claims priority, application Japan, Dec. 15, 1987, 62-316882

Int. Cl.[5] G01N *29/06*

U.S. Cl. 73—634 **11 Claims**



1. An ultrasonic imaging system comprising:

ultrasonic transmitting/receiving means including a plurality of vibrating elements for transmitting and receiving an ultrasonic beam;

pulse generating means for supplying at least one high frequency pulse at a predetermined time, said predetermined time being determined by said ultrasonic transmitting-/receiving means;

receiving means for receiving and amplifying an ultrasonic signal received by said ultrasonic transmitting/receiving means;

switching means for connecting said pulse generating means with said ultrasonic transmitting/receiving means when said ultrasonic transmitting/receiving means is in a transmitting mode and for connecting the ultrasonic transmitting/receiving means with said receiving means when said ultrasonic transmitting/receiving means is in a receiving mode;

wherein a liquid medium is interposed between an ultrasonic irradiating surface of the ultrasonic transmitting/receiving means and a test sample, and a predetermined portion in the sample is imaged by said imaging system;

input means for inputting predetermined parameters regarding said test sample and said liquid medium, said predetermined parameters including at least one of a sound velocity in said test sample, a sound velocity in said liquid medium, a physical dimension of said test sample and a physical dimension of said liquid medium;

a surface echo counter for extracting an echo of the sample surface from an output signal of said receiving means and for measuring a distance between the ultrasonic irradiating surface and the test sample from a transmission time of the ultrasonic beam and a reception time of said surface echo; and

focal point arithmetic operation control means for controlling a focus of said ultrasonic beam into said predetermined portion in the sample based on said distance measured by said surface echo counter and an output signal from said input means.

5,024,095

DIAGNOSTIC LOCATOR FOR MECHANICALLY MALFUNCTIONING ELECTRONIC CIRCUITRY

Brian Warner, 36 Austin St., Moonachie, N.J. 07074

Filed Dec. 5, 1989, Ser. No. 446,385

Int. Cl.[5] G01N *3/34*

U.S. Cl. 73—661 **2 Claims**

1. A method for detecting kinetically locatable mechanically intermittent sources of electronic circuit malfunction with a diagnostic locator comprises the steps of:

applying a vibratory test probe form the locator to the electronic circuit,

monitoring performance of circuitry being tested to detect presence of mechanical intermittence when probe energy is applied,

adjusting the diagnostic locator for increased propagation of test probe transmitted kinetic energy,

activating the test probe upon generalized areas of circuitry to determine the presence of mechanically intermittent electronic circuit malfunction,

adjusting the diagnostic locator for reduced propagation of probe transmitted kinetic energy, in response to detecting the presence of a mechanically intermittent circuit malfunction, and

applying probe transmitted energy to the area of circuitry where presence of malfunction was detected to further localize specific source of mechanically intermittent electronic circuit malfunction, and

performing repeated diagnostic localization for further reductions of propagation with the test probe transmitted kinetic energy to determine the specific source of the kinetically locatable mechanically intermittent electronic circuit malfunction.

5,024,096

COMPOSITE SLIP TABLE OF DISSIMILAR MATERIALS FOR DAMPING LONGITUDINAL MODES

Danny L. Gregory, Albuquerque; Tommy G. Priddy; David O. Smallwood, and Tommy D. Woodall, all of Albuquerque, N. Mex., assignors to United States of America as represented by the Department of Energy, Washington, D.C.

Filed Jun. 30, 1989, Ser. No. 373,416

Int. Cl.[5] G01M *7/00*

U.S. Cl. 73—663 **8 Claims**

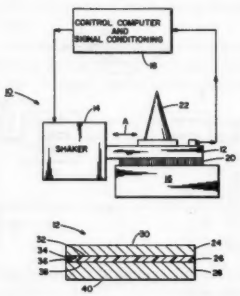
1. A slip table for use in a vibration testing apparatus, the table comprising a plurality of layers as follows:

a first planar layer of a metallic material having a characteristic acoustic velocity and a hard outer surface,

means for damping longitudinal vibration modes in the slip table comprising a second planar layer of a damping material, adjacent to said first layer,

a third planar layer of a material having a higher characteristic acoustic velocity than said metallic material of said first layer, adjacent to said second layer, and

means for attaching said plurality of layers to each other to transmit a shear force between said plurality of layers in contact,



whereby relative shear displacements between said first and third layers, created by different longitudinal modes in said first and third layers, said different longitudinal modes being caused by the different acoustic velocities of the materials of said first and third layers, are damped by said second layer, thereby reducing the overall table longitudinal vibration modes.

5,024,097

PRESSURE SENSOR COMPRISING A SILICON BODY

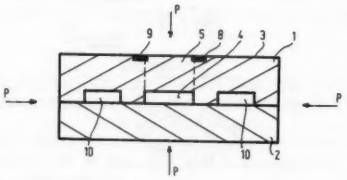
Volker Graeger, Buchholz, and Rolf U. D. Kobs, Tornesch, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 148,745, Jan. 27, 1988, abandoned. This application Sep. 20, 1989, Ser. No. 411,193

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1987, 3702412

Int. Cl.[5] G01L *9/06*

U.S. Cl. 73—727 **9 Claims**



1. A pressure sensor for static pressure loads comprising a silicon body (1) which is arranged on a substrate (2) and which comprises a cavity (4) in the form of a blind hole or enclosed chamber which faces the substrate, thus forming a diaphragm (5) which extends parallel to the base of the silicon body and on the outer surface of which there is arranged a Wheatstone bridge including piezoresistive resistance elements (6 to 9; 11, 12), two resistance elements (6, 7) thereof being centrally arranged on the diaphragm whereas the other two resistance elements (8, 9; 11, 12) are arranged at the edge of the diaphragm,

wherein a separate cavity (10) which faces the substrate (2) is provided in the silicon body on both sides of the resistance elements (8, 9; 11, 12) arranged at the edge of the diaphragm, and

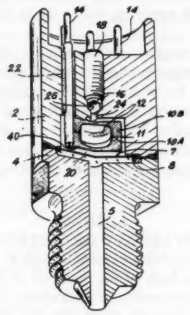
all said resistance elements reside in a more centrally located portion of said silicon body than said separate cavity.

5,024,098

PRESSURE SENSOR USEABLE IN OIL WELLS

Luc Petitjean, Vincennes, and Michel Valdois, Cachan, both of France, assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Oct. 27, 1989, Ser. No. 428,304
Claims priority, application France, Oct. 27, 1988, 88 14005
Int. Cl.[5] G01L 9/06
U.S. Cl. 73—729 7 Claims



1. A pressure sensor comprising:

a cell comprising sapphire and having an outside surface which is subjectable to a pressure to be measured, said cell having two portions of the same material joined together at a join plane, at least one of said cell portions having a deformable outside plane surface parallel to said join plane;

a hermetically sealed chamber, located inside said cell, in which a predetermined pressure is contained; and

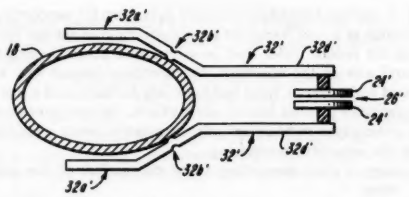
a strain-measuring device integrally deposited on said outside plane surface; wherein said cell comprises monocrystalline sapphire wherein the crystal axis thereof being perpendicular to said join plane.

5,024,099

PRESSURE TRANSDUCER WITH FLOW-THROUGH MEASUREMENT CAPABILITY

Shih-Ying Lee, Lincoln, Mass., assignor to Setra Systems, Inc., Acton, Mass.

Filed Nov. 20, 1989, Ser. No. 439,617
Int. Cl.[5] G01L 9/12
U.S. Cl. 73—730 25 Claims



1. A transducer for measuring the pressure of a fluid in the transducer comprises

a hollow conduit having (i) an inlet portion, (ii) a portion disposed adjacent said inlet portion formed by deforming said conduit to a non-circular cross-section and (iii) a first transition region extending between said non-circular portion and said inlet portion,

the material forming said conduit having a tendency to displace radially from said non-circular cross-section toward a circular cross-section in response to the pressure of the fluid, the magnitude of said radial displacement and the surface stress and strain in at least a portion of said non-circular conduit corresponding to the pressure of the fluid,

at least one pair of spaced apart electrodes forming a variable capacitor,

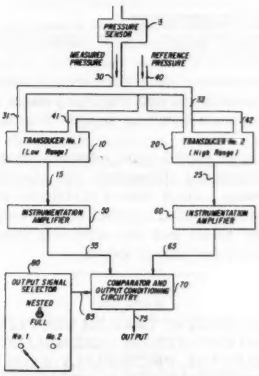
means for mounting said electrodes to the exterior of said non-circular portion for converting said radial displacement into an electrical signal that corresponds to the fluid pressure through a corresponding movement of said mounting means and both of said electrodes.

5,024,100

AUTOMATIC TRANSDUCER SELECTION SYSTEM FOR PRESSURE MEASUREMENT

Leonard M. Weinstein, Newport News, Va., assignor to Dynamic Engineering, Inc., Newport News, Va.

Filed Jun. 4, 1990, Ser. No. 532,697
Int. Cl.[5] G01L 9/01, 9/10, 9/12
U.S. Cl. 73—756 7 Claims



1. A fluid pressure measurement system comprising:

at least two pressure transducers having successively broader effective pressure sensing ranges, each of the strain gauges being capable of being subjected to an overpressure equal to a maximum pressure of the sensing ranges without an adverse effect therein;

means for connecting the transducers in parallel to the fluid pressure being measured and to a reference fluid pressure; and

comparator circuit means for receiving an output signal from each of the transducers, said circuit means functioning to select one of the transducer output signals which most closely approaches a full-range output signal of a corresponding transducer, said circuit means also functioning to generate an output signal from the selected transducer output signal.

5,024,101

POWER SOURCE CIRCUIT AND BRIDGE TYPE MEASURING DEVICE WITH OUTPUT COMPENSATING CIRCUIT UTILIZING THE SAME

Hiroaki Tanaka, Okazaki; Takeshi Enya, Nishio, and Katsumi Nakamura, Okazaki, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Nippon Soken, Inc., Nishio, both of Japan

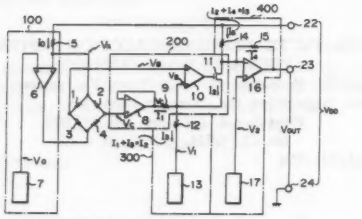
Filed Feb. 9, 1990, Ser. No. 478,097
Claims priority, application Japan, Feb. 10, 1989, 1-31728
Int. Cl.[5] G01B 7/16
U.S. Cl. 73—766 8 Claims

1. A power source circuit for providing a reference constant voltage having given temperature characteristics at a predeter-

mined temperature, the temperature characteristics of said reference constant voltage of the power source circuit being adjustable, comprising:

a voltage source for generating an adjustable constant voltage;

amplifying means for amplifying the adjustable constant voltage generated by the voltage source by an amplification factor at the predetermined temperature, the amplification factor being changed in response to a temperature


1,2,3,4—DETECTING ELEMENTS FORMING BRIDGE TYPE MEASURING DEVICE
12—SECOND RESISTOR
13—POWER SOURCE CIRCUIT
100—CONSTANT CURRENT CIRCUIT AS CONSTANT CURRENT SOURCE
200—VOLTAGE-TO-CURRENT CONVERTING CIRCUIT

difference between said predetermined temperature and a current temperature, said amplifying means outputting an amplified constant voltage at a predetermined temperature; and

output means for providing the reference constant voltage at the predetermined temperature and changing the reference constant voltage thereof in response to a difference between the amplified constant voltage output from said amplifying means and the adjustable constant voltage generated by the voltage source.

5,024,102

DEVICE FOR TESTING TRAILER COUPLINGS UNDER LOADING CONDITIONS RESEMBLING THOSE OCCURRING IN USE, PREFERABLY WITH INCLUSION OF THE CONSTRUCTION FOR FIXING THE TRAILER COUPLING

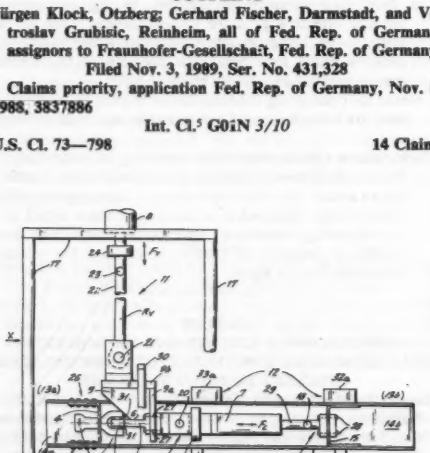
Jürgen Klock, Otzberg; Gerhard Fischer, Darmstadt, and Vatroslav Grubisic, Reinheim, all of Fed. Rep. of Germany, assignors to Fraunhofer-Gesellschaft, Fed. Rep. of Germany

Filed Nov. 3, 1989, Ser. No. 431,328

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1988, 3837886

Int. Cl.[5] G01N *3/10*

U.S. Cl. 73—798 **14 Claims**



1. An apparatus for testing a trailer coupling assembly, wherein said assembly includes at least a trailer coupling and a trailer coupling ring engaged therewith and is subjected to testing under operational forces, including longitudinal and vertical operational forces, said apparatus comprising:

(a) first support means for supporting the coupling assembly and for positionally fixing said coupling;

(b) second support means for supporting the coupling ring of said coupling assembly;

(c) a longitudinal force actuator coupled to said second support means and effective for simulating the longitudinal operational forces and for applying the same to said second support means;

(d) a vertical force actuator coupled to said second support means and effective for simulating the vertical operational forces and for applying the same to said second support means;

(e) said second support means being a rigid force transmitting connecting member to which said longitudinal and said vertical force actuators are coupled such that the direction of action of said longitudinal operational forces and the direction of action of said vertical operational forces intersect each other in a region in which said coupling ring engages said trailer coupling.

5,024,103

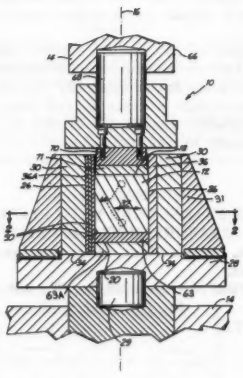
SURFACE INSTABILITY DETECTION APPARATUS

Ioannis Vardoulakis, Minneapolis; Joseph F. Labuz, and Euripides Papamichos, both of St. Paul, all of Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Filed May 31, 1990, Ser. No. 531,111

Int. Cl.[5] G01N *3/08*

U.S. Cl. 73—819 **15 Claims**



1. A surface instability detection apparatus for supporting a specimen in a load frame for testing geomaterial sample specimens for failure under load in a direction generally along a central axis of the specimen, the specimen having first and second end surfaces, front and back side surfaces, and a pair of substantially parallel lateral side surfaces, the specimen forming generally a right rectangular geometric prism configuration, the apparatus comprising:

a support plate supporting a first end surface of the specimen;

a pair of lateral side plates fixed with respect to the support plate and the adjacent two opposite lateral side surfaces of the specimen for restraining movement of the specimen in first lateral directions perpendicular to the axis;

means for loading such specimen on a second end surface under a load directed toward the support plate along the central axis of the specimen until such specimen fails;

a back side plate mounted relative to the support plate and the lateral side plates for restraining movement of the back side surface of the specimen to be tested in a second lateral direction perpendicular to the axis of loading, the back

side plate being disposed in such a manner as to connect the pair of lateral side plates; and

the front side surface of the specimen being substantially unrestrained whereby upon loading of the specimen, the specimen is forced to fail by movement of the front side surface only.

5,024,104

COMBINED OUTPUT AND DRIVE CIRCUIT FOR A MASS FLOW TRANSDUCER

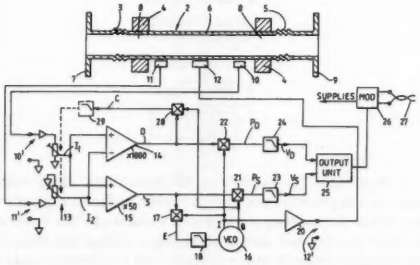
Andrew N. Dames, London, England, assignor to Schlumberger Industries Limited, Farnborough, England

Filed Dec. 21, 1989, Ser. No. 454,250

Claims priority, application United Kingdom, Dec. 21, 1988, 8829825

Int. Cl.[5] G01F *1/84*

U.S. Cl. 73—861.37 **16 Claims**



1. A combined output and drive circuit for providing a drive signal for a drive transducer of a mass flow transducer in response to two input signals fed to the circuit from spaced pick-up transducers of the mass flow transducer, comprising means for forming a first signal from at least one of the two input signals and a difference signal from the input signals, a phase locked loop oscillator circuit controlled by the first signal and providing the drive signal and first and second multiplying signals in phase quadrature with each other, means for multiplying the first and difference signals by the first and second multiplying signals respectively to form two product signals, and low pass filter means for filtering the two product signals to provide two measurement voltages related to phase difference and hence to mass flow rate.

5,024,105

VISCOSITY-INSENSITIVE VARIABLE-AREA FLOWMETER

Michael L. Tentler, 11420 Luz Rd., San Diego, Calif. 92127, and Gerald L. Wheeler, 10390-D E. Briar Oaks, Stanton, Calif. 90680

Filed Mar. 28, 1989, Ser. No. 329,433

Int. Cl.[5] G01F *1/26*

U.S. Cl. 73—861.58 **4 Claims**

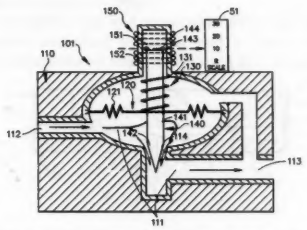
1. A variable area fluid flow regulator comprising:

a housing defining a chamber having a connection to an inlet port and two spaced-apart flow connections to an outlet port;

flexible diaphragm means, dividing the chamber at a position between the two spaced-apart outlet port connections so that one outlet port flow connection dead ends in the portion of the chamber on one side of the diaphragm while a channel for flowing fluid between the inlet port and the outlet port is defined in the remaining portion of the chamber on the other side of the diaphragm, for moving in response to differential pressure between the inlet port and the outlet port; and

a force biasing means, operatively connected between the flexible diaphragm means and the housing, for force biasing the movement of the flexible diaphragm means against the force of the differential pressure; and

a flow controller means, operatively connected to the flexible diaphragm means for moving therewith, for moving relative to the channel and relative to any fluid flowing therein in order to variably occlude the channel and to adjust the rate of fluid flow therein until the differential pressure across the flow controller means equals the force of the force biasing means;



the operative connection between the flexible diaphragm means and the flow controller being so that an increased fluid frictional drag force on the flow controller where it moves to variably occlude the channel acts mechanically oppositely to a change in a static differential pressure force on the flexible diaphragm means due to the same increased fluid frictional drag force, the mechanically oppositely-acting forces tending to cancel each other.

5,024,106

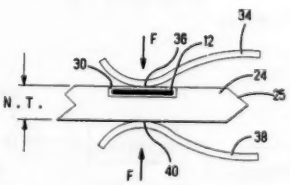
CONTACT SYSTEM NORMAL FORCE GAGE

Arthur C. Hettinger, Camp Hill, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 13, 1990, Ser. No. 492,692

Int. Cl.[5] G01L *1/18, 5/00*

U.S. Cl. 73—862.54 **5 Claims**



5. A gage for measuring normal forces of the type developed by spring elements including in combination a gage body of metal of a thickness approximating the nominal dimension of a terminal engaging the contact spring element in use, a relief within said body and a gage element fitted within the volume of said relief and flush with the upper surface thereof including a planar slice of silicon having an upper area broader than the thickness thereof to receive the contact spring under test bearing normally thereupon, a piezoresistive circuit means diffused into the material of said silicon along one edge thereof, and first means to apply voltage to said piezoresistive circuit with second means to measure the changes in resistivity as a function of the normal force applied to said silicon slice by virtue of engagement with said contact spring under test.

5,024,107

PRESSURE OR FORCE SENSOR HAVING AN AXIALLY SYMMETRICAL PRESSURE OR FORCE-RECEIVING CIRCULAR PLATE SPRING

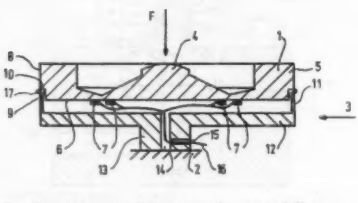
Klaus W. B. Bethe, Braunschweig, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 11, 1989, Ser. No. 378,343

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1988, 3823673

Int. Cl.[5] G01L 1/22

U.S. Cl. 73—862.65 10 Claims



1. A load sensor comprising a carrier, an axially symmetrical load receiving circular plate spring having a mainly flat side, an opposing profiled side, and a reinforced edge region supported on said carrier, and strain gauges disposed on said circular plate spring, characterized in that:

said circular plate spring is supported by said carrier at an annular zone of said reinforced edge region in which the radial expansion of said spring is substantially zero under load.

5,024,108

SAMPLE ANALYZER

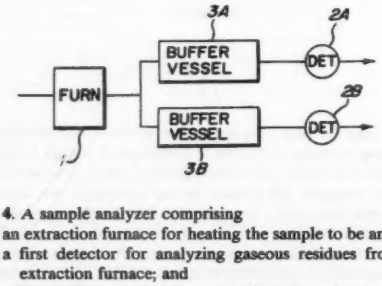
Yasuyuki Nishioka, Nagaokakyo, and Akihiro Hirano, Kyoto, both of Japan, assignors to Horiba, Ltd., Kyoto, Japan

Filed Dec. 28, 1989, Ser. No. 458,091

Claims priority, application Japan, Jan. 14, 1989, 1-2975

Int. Cl.[5] G01N 1/22

U.S. Cl. 73—863.11 5 Claims



4. A sample analyzer comprising

an extraction furnace for heating the sample to be analyzed;

a first detector for analyzing gaseous residues from said extraction furnace; and

a first buffer vessel having an adjustable volume capacity disposed between said extraction furnace and said first detector, said buffer vessel including a piston inside the vessel capable of being moved to adjust the internal volume capacity of the vessel, said piston having an outlet passage to permit gas to flow from the vessel.

5,024,109

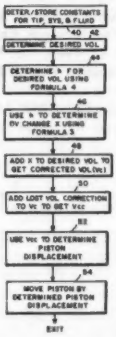
METHOD AND APPARATUS FOR PERFORMING HYDROSTATIC CORRECTION IN A PIPETTE

Hugo Romero, New Rochelle, N.Y., and Robert Anderson, Monroe, Conn., assignors to Medical Laboratory Automation, Inc., Pleasantville, N.Y.

Filed Feb. 8, 1990, Ser. No. 477,314

Int. Cl.[5] G01N 1/14

U.S. Cl. 73—864.16 20 Claims


DETER/STORE CONSTANTS FOR TIP, SYS, & FLUID
40
42
DETERMINE DESIRED VOL
44
DETERMINE h FOR DESIRED VOL USING FORMULA 4
46
USE h TO DETERMINE DV CHANGE X USING FORMULA 5
48
ADD X TO DESIRED VOL TO GET CORRECTED VOL (Vc)
50
ADD LOST VOL CORRECTION TO Vc TO GET Vcc
52
USE Vcc TO DETERMINE PISTON DISPLACEMENT
54
MOVE PISTON BY DETERMINED PISTON DISPLACEMENT
EXIT

1. Apparatus for correcting for hydrostatic dead volume error in a pipette system, which system includes a pipette tip, and means for moving a controlled volume of fluid either into or from the tip, said means including a piston and means for causing said piston to move in controlled increments, said dead volume being formed between the fluid and piston when fluid is drawn into said tip, the apparatus comprising:

means for determining the height h of fluid in said tip for a desired fluid volume;

means for determining the change in the dead volume resulting from having fluid of such height in the tip; and

means for determining the piston displacement required to achieve a volume equal to the sum of the desired volume plus the determined change in dead volume, this being the piston movement required to achieve the desired fluid volume.

5,024,110

CELL FOR SAMPLING AND STORING FLUID DEPOSITS

Roger Doussiet, Lezat S/Leze, and Louis Labadie, Montrejeau, both of France, assignors to Societe Nationale Elf Aquitaine (Production), Courbevoie, France

Filed Jan. 8, 1990, Ser. No. 462,034

Claims priority, application France, Jan. 10, 1989, 88 00219

Int. Cl.[5] G01N 35/06

U.S. Cl. 73—864.62 11 Claims

1. Cell for sampling and storing fluid deposits, comprising:

a pump body having a displaceable piston which divides an inner space of the pump body into a front chamber and a rear chamber; and

a control device for displacing the piston via a rod integral with the piston;

wherein the complementarity of the shapes of a rear face of the piston and of a corresponding inner face of the pump body make a volume of the rear chamber very small as compared to a volume of the rear chamber when the piston is in a storing position;

wherein, in the storing position, a unit formed by the rear chamber and the front chamber is insulated from an exterior of the cell by a seal formed automatically when the piston arrives at the storing position during sampling;

wherein the complementarity of the shapes of the rear face of the piston and the inner face of the pump body includes

a recess in a rear part of the piston, the recess having a shape which substantially complements a front part of an extension of the pump body, the front part of the extension engaging the recess in the rear part of the piston at the storing position; and

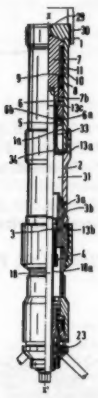
wherein a cylindrical part of the piston forming a portion of the recess in the rear part of the piston is force-fitted by its radial elasticity onto an outer part of the extension of the pump body, to form the seal which insulates the unit of the front and rear chambers from the exterior of the cell.

8. Cell for sampling and storing fluid deposits, comprising:

a pump body having a displaceable piston which divides an inner space of the pump body into a front chamber and a rear chamber; and

a control device for displacing the piston via a rod integral with the piston;

wherein the complementarity of the shapes of a rear face of the piston and of a corresponding inner face of the pump



body make a volume of the rear chamber very small as compared to a volume of the front chamber when the piston is in a storing position;

wherein, in the storing position, a unit is formed by the rear chamber and the front chamber is insulated from an exterior of the cell by a seal formed automatically when the piston arrives at the storing position during sampling;

wherein the complementarity of the shapes of the rear face of the piston and the inner face of the pump body includes a recess in a rear part of the piston, the recess having a shape which substantially complements a front part of an extension of the pump body, the front part of the extension engaging the recess in the rear part of the piston at the storing position; and

wherein locking means for locking the piston in translational movement includes a series of cylindrically arranged plugs which are radially elastic and have an end flange which engages a throat of the extension so as to lock the piston in translational movement.

5,024,111

ADJUSTMENT OF ZERO SPRING RATE SUSPENSIONS

Thomas J. Harvey, Lompoc, Calif., assignor to AEC-Able Engineering Co., Inc., Goleta, Calif.

Filed Oct. 30, 1989, Ser. No. 428,395

Int. Cl.[5] F16M *13/00*

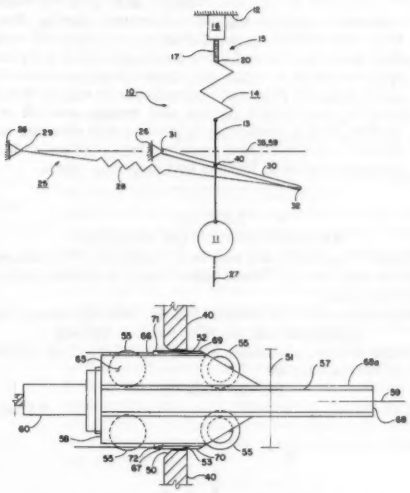
U.S. Cl. 73—865.6 **5 Claims**

1. An adjustment system for a zero spring rate suspension system, said suspension system having the property of providing a zero spring rate response to limited vertical excursions from a reference level, said suspension system including a load suspension spring supported from a load spring anchor; said adjustment system comprising:

a rigid reference element below the suspension spring whose elevation is a function of load spring extension and elevation of the load spring;

bi-directional drive means interposed between said load spring and said load spring anchor to move the upper end of said load spring up or down along a vertical axis, said drive means including a bi-directional motor, said reference element including an aperture, said aperture having an upper and a lower edge;

a probe insertable into and removable from said aperture, said probe including an upper and a lower electrical contact, said contacts being so disposed and arranged as to



make conductive contact with a respective edge when the reference element is sufficiently above or below a reference level, there being a vertical dimension between said edges, the vertical spacing between said probe contacts being smaller than said vertical dimension to permit limited excursion of said reference element from said reference level, said contacts and edges being rigid and non-springing; and

circuit means responsive to contact of said probe contacts and edges to power said motor to adjust the elevation of the load spring relative to the reference level to move the contact away from the respective edge and thereby to tend to restore the reference element to the reference level.

5,024,112

GYROSCOPIC APPARATUS

Alexander D. Kidd, Barnhill, Scotland, assignor to Noel Carroll, Victoria, Australia, a part interest

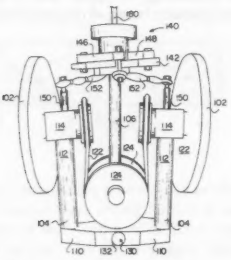
PCT No. PCT/AU87/00418, § 371 Date Aug. 3, 1989, § 102(e) Date Aug. 3, 1989, PCT Pub. No. WO88/04363, PCT Pub. Date Jun. 16, 1988

PCT Filed Dec. 9, 1987, Ser. No. 378,236

Claims priority, application United Kingdom, Dec. 9, 1986, 8629405

Int. Cl.[5] G01C *19/06;* F16H *27/04*

U.S. Cl. 74—5.37 20 Claims



1. A gyroscopic apparatus comprising:

a pair of rotatable masses disposed opposite one another;

means for mounting said masses which enable said masses to pivot about a pivot axis, said pivot axis lying in a mirror image plane which is directly between said masses;

drive means for driving said masses so as to give said masses respective opposite angular momentums, having directions substantially perpendicular to and directed away from said plane second drive means, and for driving said apparatus so as to rotate said masses about a central axis which is in said plane and perpendicular to said pivot axis;

means for periodically forcing said masses towards one another from a predetermined position and allowing said masses to return to said predetermined position so as to generate a pulsatile force in said mounting means.

5,024,113

REVERSE DRIVE FOR VEHICLE

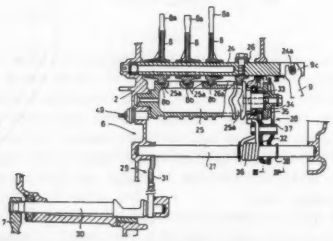
Toshifumi Ito; Atsuo Ohta, and Shoji Yamashita, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 244,332, Sep. 15, 1988, abandoned. This application Jun. 26, 1990, Ser. No. 542,649

Claims priority, application Japan, Sep. 19, 1987, 62-233748; Oct. 3, 1987, 62-151780

Int. Cl.[5] F60K *23/00*

U.S. Cl. 74—6 8 Claims



1. A vehicle comprising:

a driving wheel;

an output shaft drivingly connected to said driving wheel;

an internal combustion engine operatively connectable to said output shaft through gear train means defining a variable forward motion transmission;

a reverse drive motor operatively connectable to said output shaft through a gear train defining a reverse motion transmission;

a speed change shift device for selectively connecting either said forward motion transmission or said reverse motion transmission to said output shaft, said speed change shift device including a movable operator containing a plurality of mutually spaced cam means including first cam means operable when said speed change shift device is in a first position to operably connect said forward motion transmission to said output shaft to the exclusion of said reverse motion transmission, and second cam means operable when said operator is in a second position spaced from said first position to operably connect said reverse motion transmission to said output shaft to the exclusion of said forward motion transmission; and

means for moving said speed change shift device operator between said positions.

5,024,114

WOBBLE DRIVE FOR A TRANSLATIONALLY MOVING STRUCTURAL PART

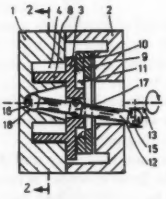
Kurt Güttinger, Murten, Switzerland, assignor to Gutag Innovations AG, Murten, Switzerland

Filed Sep. 19, 1989, Ser. No. 409,325

Claims priority, application Switzerland, Sep. 20, 1988, 03492/88-2

Int. Cl.[5] F16H *23/08;* F04C *3/00*

U.S. Cl. 74—86 4 Claims



1. A wobble drive for a structural part moving in translation and being maintained relative to a stationary structural part in a predetermined angular relationship, said stationary structural part having a bearing bush and said translationally moving structural part having a hub, said wobble drive comprising:

a wobble rod;

a crank drive mechanism for driving said wobble rod, said crank drive mechanism having an axis and a bearing bush;

said wobble rod having a first spherical section mounted in the bearing bush of the crank drive mechanism;

said wobble rod having a second spherical section mounted coaxially relative to the crank drive mechanism in an articulation socket of the bearing bush of the stationary structural part;

said wobble rod having a third spherical section located between opposite ends thereof, said third spherical section being supported rotatingly and pivotingly in an articulation socket of a bearing bush in the hub of the translationally moving structural part;

said bearing bushes for the second and third spherical sections being hemispherical articulation sockets located in the manner of a mirror image in the two structural parts;

spring means for ensuring full contact of the second and third spherical section in their respective articulation sockets.

5,024,115
SPINDLE DRIVE

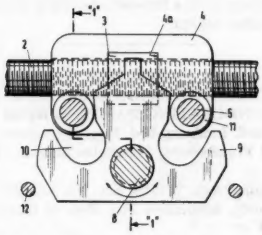
Walter Hahn, Frankfurt; Ferdinand Lutz, Heppenheim, and Manfred Jahn, Limeshain, all of Fed. Rep. of Germany, assignors to Asea Brown Boveri Aktiengesellschaft, Mannheim, Fed. Rep. of Germany

Filed Apr. 20, 1990, Ser. No. 511,624

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1989, 3913080

Int. Cl.[5] F16H *27/00*

U.S. Cl. 74—89.15 **12 Claims**



1. Spindle drive for generating a rotational motion, comprising a drive shaft, at least one sliding block disk being mounted on said drive shaft and having recesses formed therein, two retaining bolts, a carriage in which said retaining bolts are fastened, a single slide nut for moving said carriage, and a drive spindle for moving said retaining bolts through said slide nut and said carriage into engagement with said recesses.

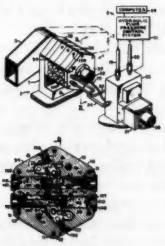
5,024,116
MODULAR ROTARY ACTUATOR

Brett W. Kraft, 11667 W. 90th St., Overland Park, Kans. 66214

Filed Jun. 8, 1989, Ser. No. 363,171

Int. Cl.[5] F16H *21/44;* F01B *9/00*

U.S. Cl. 74—109 **24 Claims**



1. A rotary actuator comprising:

(a) an elongate drive shaft having pinion gear teeth mounted thereon and an axis of rotation; said shaft being adapted to join with and rotate a tool; and

(b) a plurality of modular and interchangeable drive units positioned axially along said shaft; each of said drive units including at least one fluid actuated member having drive teeth thereon mating with said shaft gear teeth so as to operably rotate said shaft when each of said drive units is activated; each of said drive units including aligned axial ports and interconnecting conduits to operably provide for actuating fluid to be simultaneously transferred among said drive units such that each of said members is simultaneously selectably actuated to rotate said drive shaft about the axis of rotation thereof in a common direction.

5,024,117
APPARATUS FOR SUPPORTING SHIFT LEVER FOR TRANSMISSION

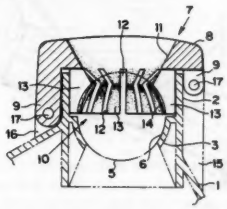
Ichiji Yamada, Toyota, Japan; Yutaka Inuzuka, West Bloomfield, Mich.; Michiyuki Murakami, Toyoake; George Suzuki, Chiryu; Tyo Tanahashi, Aichi, and Takeshi Kondo, Nagoya, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota and Tsuda Industries Company, Ltd., Kariya, both of Japan

Filed Mar. 21, 1990, Ser. No. 496,942

Claims priority, application Japan, Mar. 30, 1989, 1-37014[U]

Int. Cl.[5] G05G *8/16;* F16C *11/06;* F16D *1/12*

U.S. Cl. 74—473 P **5 Claims**



1. An apparatus for supporting a shift lever for a transmission, the shift lever including a ball-like portion provided at an intermediate portion of the shift lever, the ball-like portion having a lower spherical surface of a fixed curvature on at least a part of a lower side thereof and an upper spherical surface on a part of an upper side thereof, said apparatus for supporting a shift lever comprising:

a cylindrical shift-lever supporting section in which said ball-like portion is inserted;

a projecting section formed on the inner surface of said shift-lever supporting section to form a receiving surface, the receiving surface having a concave partial spherical surface of nearly the same curvature as the lower spherical surface of said ball-like portion and being in contact with said lower spherical surface;

a cap section detachably attached to an open upper end of said shift-lever supporting section; and

a plurality of tongue sections separated by slits and extending along a direction substantially parallel with a center axis of said shift lever, said tongue sections projecting downward from the cap section and being able to elastically deform, said tongue sections forming a retaining surface which has a concave partial spherical surface in surface contact with the upper spherical surface of said ball-like portion such that said ball-like portion is held between said concave spherical surface and said receiving surface, wherein the diameter of said retaining surface is smaller than the outer diameter of the ball-like portion, and wherein the tongue sections elastically deform when they touch and retain the upper spherical surface of the ball-like portion.

5,024,118
STEERING COLUMN GUIDE STRUCTURE

Mustafa A. Khalifa, Dearborn, and James Chapp, Jr., West Bloomfield, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

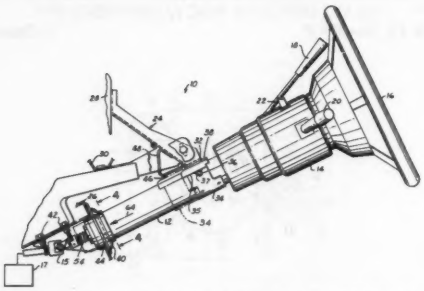
Filed Jan. 22, 1990, Ser. No. 468,349

Int. Cl.[5] B62D *1/18*

U.S. Cl. 74—492 **1 Claim**

1. A steering column guide structure for a collapsible vehicle steering column, the steering column including a sleeve, a steering wheel assembly secured to the upper end of the sleeve, a steering shaft extending from the steering wheel assembly through the sleeve, an upper support bracket secured to vehicle support structure, a sleeve bracket releasably connecting the upper portion of the sleeve to the upper support bracket,

the sleeve bracket including a pair of spaced apart flanges, a lower support bracket including a frangible retainer, the lower support bracket secured to vehicle support structure, the frangible retainer connected to the lower portion of the sleeve, the steering column guide structure comprising a pair of spaced apart triangular guide members, each triangular guide member being secured to the upper support bracket adjacent to and above one of the flanges of the sleeve bracket, each of said triangular guide members including a ramp surface formed by



a leg thereof, and a guide collar connected to said lower support bracket, the guide collar including an axially extending cylindrical surface encircling the lower portion of said sleeve and being spaced slightly therefrom, whereby upon collapse of the steering column the flanges of the sleeve bracket will slide on the ramp surfaces of the triangular guide members thereby preventing upward movement of the upper portion of the sleeve and the lower portion of the sleeve will be axially guided by the guide collar thereby preventing undue axial deviation of the lower portion of the sleeve.

5,024,119

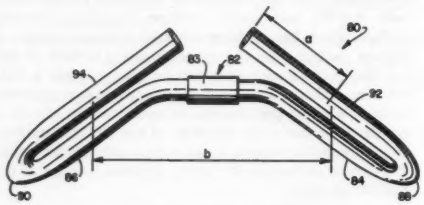
BICYCLE HANDLEBARS

Paul R. Linden, 221 Piedmont Rd., Columbus, Ohio 43214

Continuation-in-part of Ser. No. 867,773, May 28, 1986, abandoned. This application Nov. 17, 1986, Ser. No. 931,601

Int. Cl.[5] B62K *21/12*

U.S. Cl. 74—551.1 **15 Claims**



1. Handlebars for attachment to a bicycle having a front portion including a head assembly and a seat at given elevation rearwardly disposed therefrom and aligned therewith along a central axis of said bicycle for supporting a cyclist from beneath the pelvic region, comprising:

a support portion rigidly connectable with said head assembly; and

right- and left-hand grip portions for being gripped by the hands of said cyclist, each having a grip axis extending substantially in a common plane from respective right and left ends of said grip portions, said right and left grip portions being mutually laterally spaced in substantial correspondence with the widthwise interior spacing of the shoulders of said cyclist, supported by said support portion to position each to locate said right and left ends in spaced mutual adjacency and above said head assembly, said right- and left-hand grip portions extending rearwardly outwardly from respective said right and left ends to normally provide an angular orientation of each said grip axis of about 45° with respect to said central axis to be hand grippable by said cyclist in a manner generating minimal arm muscular tension, said left-hand and right-hand grip portions being positionable by said support portion along said axis a predetermined distance from said seat and at an elevation with respect to said seat elevation selected to cause said cyclist to lean slightly forwardly to an extent effecting forward rotation of said pelvic region while maintaining a posture effecting an elongation of the spinal column with a forward, naturally concave curving of the lumbar region.

5,024,120

TORSIONAL VIBRATION DAMPER WITH AN UNDULATING DAMPING RING

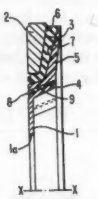
Rainer H. Andrä, Limburg, Fed. Rep. of Germany, assignor to Firma Carl Freudenberg, Weinheim/Bergstr., Fed. Rep. of Germany

Filed Aug. 1, 1989, Ser. No. 388,234

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1988, 3826088

Int. Cl.[5] F16F *15/10*

U.S. Cl. 74—574 **10 Claims**



1. A torsional vibration damper having a longitudinal axis of rotation comprising:

(a) a central hub having means for connection to a part to be damped;

(b) a rotatable inertial ring surrounding the central hub to form a clearance space therebetween;

(c) a damping element disposed in said clearance space, said damping element including

(i) a longitudinally flexible radially inner ring;

(ii) a circumferentially flexible radially outer ring; and

(iii) a flange ring disposed between said radially inner and radially outer rings;

(d) first and second substantially axially opposed, adhesive surfaces formed on said inertial ring and said flange ring, respectively, said radially outer ring being connected between said first and second adhesive surfaces to damp circumferential vibrations; and

(e) third and fourth substantially radially opposed, adhesive surfaces formed on said flange ring and said central hub, respectively, said radially inner ring being connected between said third and fourth adhesive surfaces to damp longitudinal vibrations, each of said third and fourth adhesive surfaces surrounding the longitudinal axis of rotation at a radial distance that continuously varies in the circumferential direction.

5,024,121

HUB ASSEMBLY OF A BICYCLE AND THE LIKE

Kin H. Hsieh, No. 125, Shih Chien St., Feng Yuan City, Taiwan

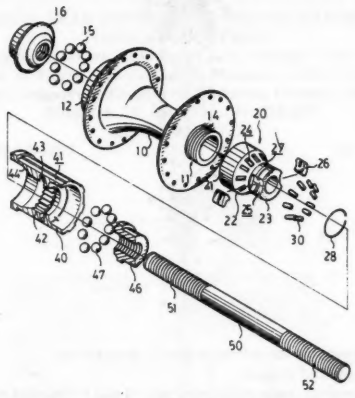
Filed Oct. 15, 1990, Ser. No. 597,018

Int. Cl.[5] G05G *1/14*

U.S. Cl. 74—594.1 **1 Claim**

1. A hub assembly comprising an axle having an outer thread formed on each end thereof; a hub having a first belled end

formed on one end thereof and a second belled end formed on another end thereof; a first cone threadedly engaged to one end of said axle; a first ball bearing received between said first belled end of said hub and said first cone; a collar having an enlarged diameter poriton and a reduced diameter portion integrally coupled together by a frustum, said enlarged diameter portion being threadedly engaged with said second belled end of said hub, a plurality of oblong holes being formed on an outer surface of said frustum, a roller being rotatably received in each of said oblong holes, at least one recess and an annular groove being formed on an outer peripheral surface of said reduced diameter portion of said collar, a pawl being received in each recess, a retaining ring being received in said annular



groove for biasing a free end of each pawl outwards; a sleeve having an annular flange and an annular rib formed in an inner surface thereof, a tapered surface being formed on one end of said annular flange for sliding engagement with said rollers, a plurality of ratchet gear teeth being formed in an inner surface of said annular flange for engagement with said pawl so that said collar and said hub can be driven to rotate unidirectionally by an engagement between said pawl and said ratchet gear teeth; a second cone threadedly engaged to another end of said axle; a second ball bearing received between said second cone and said annular rib; and said annular flange and said rollers having a large contact surface so that said sleeve can be stably supported in rotational relationships with said collar.

5,024,122

TRANSMISSION HOUSING WITH A SUPPORT FOR A SHAFT CARRYING AT LEAST ONE GEAR

Franz Parzl, Woerthsee, and Johann Eichinger, Vaterstetten, both of Fed. Rep. of Germany, assignors to Carl Hurth Maschinen- und Zahnradfabrik GmbH & Co., Munich, Fed. Rep. of Germany

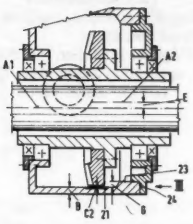
Continuation of Ser. No. 243,077, Sep. 9, 1988, abandoned. This application Jul. 18, 1990, Ser. No. 555,815

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1987, 3733567

Int. Cl.[5] F16H *57/02*

U.S. Cl. 74—606 R **4 Claims**

1. In combination in a transmission for use as an axle drive unit for a railway vehicle: a shaft, a gear provided on said shaft, a transmission housing having side walls and a bottom wall, and support means for supporting said shaft carrying said gear, said support means including a bearing bracket and including a first roller bearing and a second roller bearing each having an outer ring, said outer ring of said first roller bearing being arranged in a corresponding first housing bore in said transmission housing and said outer ring of said second roller bearing being arranged in a corresponding bore of said bearing bracket, said bearing bracket being centered in a corresponding circular second housing bore in said transmission housing, the diameter of said second housing bore, in order to permit an axial introduction of said shaft into said transmission housing, being at least as large as the outside diameter of said gear, the improvement wherein said transmission housing is free of structure projecting below a plane containing said bottom wall, wherein a first axis of said first housing bore and a second axis of said second housing bore are radially offset in a first direction and by a first amount with respect to one another, said first axis being oriented closer to said bottom wall of said transmission housing than said second axis, and wherein a third axis of said bore in said bearing bracket is radially offset with respect to



said second axis by the same first amount and in the same first direction so that said third axis will be coaxial with said first axis of said first housing bore, said gear having a radius greater than a radial distance from said third axis to a lowermost surface portion of said second housing bore and less than a radial distance from said third axis to said bottom wall so that the outer perimeter of said at least one gear on said shaft is immediately adjacent said bottom wall and is below said lowermost surface portion of said second housing bore to thereby facilitate an optimization of a minimum spacing between said first axis and an underside of said bottom wall of said transmission housing.

5,024,123

Patent Not Issued For This Number

5,024,124

ELECTRIC DRIVE WITH MANUAL DOUBLER

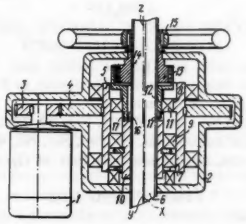
Nikolai P. Popov, prospekt Ispytatelei, 31, korpus 1, kv. 507; Andrei D. Plotnikov, Prospekt Nastavnikov, 25, korpus 3, kv. 101, and Grigory N. Klotsvog, Ulitsa Gavanskava, 11, kv. 43, all of Leningrad, U.S.S.R.

PCT No. PCT/SU88/00153, § 371 Date Dec. 15, 1989, § 102(e) Date Dec. 15, 1989, PCT Pub. No. WO90/01127, PCT Pub. Date Feb. 8, 1990

PCT Filed Jul. 27, 1988, Ser. No. 449,870

Int. Cl.[5] F16K *31/143*

U.S. Cl. 74—625 **3 Claims**



1. An electric drive with manual doubler, comprising an electric motor, a frame, a sleeve located in the frame, a lead screw, a sliding nut placed within the sleeve eccentric to the lead screw axis, a gear wheel arranged eccentric to the lead screw axis, connected with the sliding nut, and being in engagement with a gear bush arranged concentric with the lead screw and rotatably mounted inside the frame, a manually

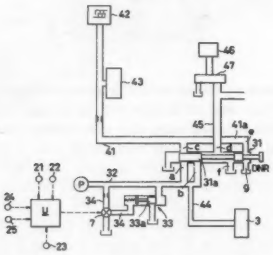
operated handwheel rigidly coupled to the gear bush, characterized in that said gear wheel and sliding nut are interconnected and capable of restricted angular displacement with respect to each other, and the inner surface of said gear bush serves as the datum surface for the lead screw.

5,024,125

SHIFT CONTROL SYSTEM FOR AN AUTOMATIC TRANSMISSION

Fumiaki Baba, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Apr. 6, 1990, Ser. No. 505,608
Claims priority, application Japan, Apr. 7, 1989, 1-86993
Int. Cl.[5] B60K *41/06*
U.S. Cl. 74—866 25 Claims



1. A shift control system for an automatic transmission, comprising:

a torque converter;

a multiple stage gear mechanism for performing a shift by shifting an operational state of a friction coupling element of a hydraulic pressure type, which is coupled to the torque converter;

a shift control means for controlling operation of the friction coupling element on the basis of a predetermined shift characteristic;

a temperature detecting means for detecting a temperature of an operating oil for the torque converter and the friction coupling element; and

a shift characteristic shifting means for shifting the shift characteristic so as to make a range of driving at least at a first speed stage narrow during a cold time period when the temperature of the operating oil detected by the temperature detecting means is equal to or lower than a predetermined value.

5,024,126

SLIP-RESISTANT PLASTIC SURFACE AND PROCESS FOR PRODUCING SUCH

Horst Holland-Letz, and Rainer Bubel, both of Neustadt/-Hessen, Fed. Rep. of Germany, assignors to Felo-Werkzeugfabrik, Fed. Rep. of Germany

Continuation of Ser. No. 157,894, Feb. 19, 1988, abandoned.
This application Mar. 5, 1990, Ser. No. 489,788
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1987, 3705298
Int. Cl.[5] B25G *1/01*
U.S. Cl. 81—489 5 Claims

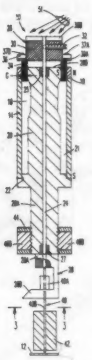
5. A tool having a plastic handle with a slip-resistant gripping surface in which said surface is produced by coating the handle of said tool with a film of a solution of the polymer from which said handle is made, in which solution crystalline material has been dispersed and permitting the solvent in said film to evaporate after it has partially solvated and softened the surface of said plastic handle.

5,024,127

PUNCHING MECHANISM

Wolfgang F. Mueller, Wappingers Falls; George Popp, Pleasant Valley, and George B. Vandergheynst, Lagrangeville, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 10, 1989, Ser. No. 419,873
Int. Cl.[5] B26D *1/00*
U.S. Cl. 83—13 15 Claims



1. Apparatus for driving a punch comprising:

a permanent magnet;

a pole-piece connected to one pole of said permanent magnet and spaced from the other pole of said permanent magnet by a gap;

a movable coil disposed at least partially within said gap;

means connected to said movable coil for engaging and actuating said punch; and

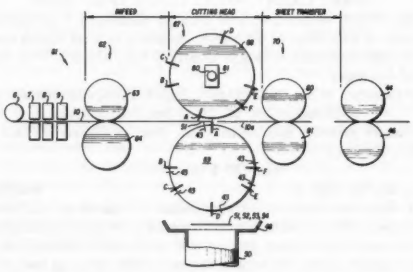
means for conducting an electrical current to said coil.

5,024,128

SHEETER FOR WEB FED PRINTING PRESS

Gaines P. Campbell, Jr., 227 Fleetwood Dr., Lookout Mountain, Tenn. 37350

Filed Feb. 21, 1989, Ser. No. 312,913
Int. Cl.[5] B26D *1/56*
U.S. Cl. 83—26 5 Claims



1. A method of cutting a web containing a plurality of portions of predetermined length fed through a printing press comprising:

feeding a continuous web into a first cutting head at a first surface speed;

cutting the web transversely by said first cutting head rotating at a second higher surface speed to form a separated portion and an uncut portion of said web;

feeding the uncut portion of said web into a second cutting head rotating at said second higher surface speed; cutting said uncut portion of said web with said second cutting head to form a separated portion of predetermined length and a further uncut portion;

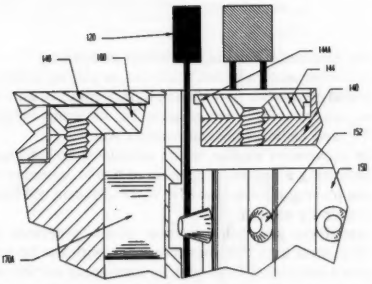
cutting a chip from the further uncut portion of said web by said first cutting head; removing said chip by said second cutting head; and removing said separated portion of predetermined length to a delivery system at a third surface speed higher than said first and second surface speeds.

5,024,129

RADIAL LEAD COMPONENT FEEDER HAVING A NARROW FOOTPRINT

Gregory W. Holcomb, 6336 Bryce Ave., Orange, Calif. 92667; Scott A. Hogan, and Samuel R. Holcomb, both of Orange, Calif., assignors to Gregory W. Holcomb, Orange, Calif.

Filed Jun. 29, 1989, Ser. No. 374,159
Int. Cl.[5] B26D *7/18*
U.S. Cl. 83—107 **22 Claims**



1. A radial lead component feeder apparatus for clamping and cutting to a predetermined length the leads of electrical components secured to tape, the feeder characterized by a longitudinal center line, the electrical components being characterized by a component body and in that component lead or leads emerge from generally the same side or portion of the component body, the apparatus comprising:

a rotary tape drive means for driving the tape on which the electrical components are secured to sequentially position components at a lead clamping and cutting station, said drive means comprising a drive wheel having means for engaging the tape about the wheel periphery and mounted for rotation about a wheel axis which extends in a direction substantially perpendicular to said center line;

a lead clamping and cutting station fixed in position at the periphery of said wheel along said center line, said station comprising means for clamping at least one lead of the component positioned at the station and means for cutting to a predetermined length the component leads, wherein said component is held in place at said station after said lead has been cut in readiness for removal; and

means for guiding the tape to which the components are secured to the rotary tape drive means and means for guiding the spent tape away from the drive means after the leads of respective successive components have been clamped and cut to said predetermined length.

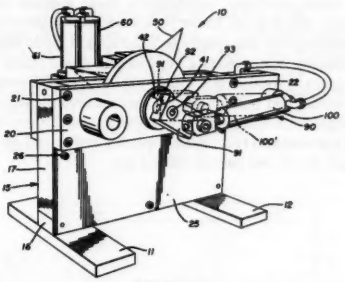
5,024,130

FLYKNIFE CUTTER FOR EXTRUDED MATERIALS

Donald F. Hays, Jr., Silver Lake Village, Ohio, assignor to Extrusion Services, Inc., Stow, Ohio

Filed Apr. 10, 1989, Ser. No. 335,832
Int. Cl.[5] B26D *1/26, 5/12*
U.S. Cl. 83—444 **19 Claims**

1. Apparatus for repeatedly severing rubber and plastic material at selected locations along a length thereof comprising, frame means, arbor means mounted on said frame means carrying a knife blade for rotation in a circular path, guide means for supporting the material to be severed in the path of rotation of said knife blade, means for selectively intermittently



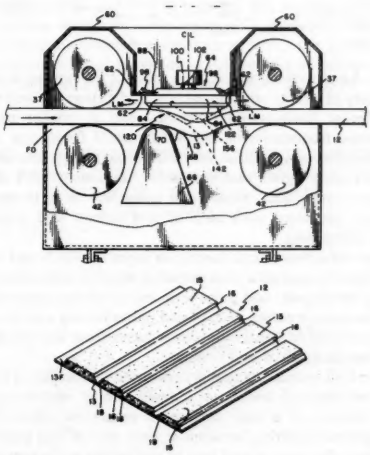
driving said arbor means for instituting rotation of said knife blade, and a single means for both supplementing the driving of said arbor means and for braking said arbor means to a stop after said knife blade has severed the material.

5,024,131

DUCT BOARD CUTTER

Roger F. Weidman, 2900 W. 55th St. South, Wichita, Kans. 67217

Filed Mar. 20, 1989, Ser. No. 326,088
Int. Cl.[5] B26D *3/06*
U.S. Cl. 83—875 **5 Claims**



1. A machine for forming a formation in a sheet of material comprising:

a frame, said frame including a pair of spaced lips defining a generally rectangular opening having a center line;

a pair of upper rotatable rollers rotatably connected to said frame;

a pair of lower rotatable rollers rotatably connected to said frame;

a single stationary cutting bar secured to said frame underneath said rectangular opening and off-set with respect to said center line;

a powered means mounted to said frame for rotating said

pair of upper rollers and said pair of lower rollers to move a sheet of material through said frame; and

a blade assembly removably and slidably mounted to said pair of spaced lips and adapted to adjust laterally across said rectangular opening;

said blade assembly comprises a blade support having a frame top, a guide frame secured to said frame top, and a clamping bar removably secured to said guide frame, said clamping bar extending beyond said guide frame to form a space between the frame top and said clamping bar wherein said pair of spaced lips removably and slidably lodges such that said blade assembly can be moved laterally across said rectangular opening and to and away from each lip of said pair of spaced lips.

5,024,132

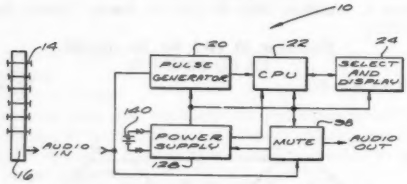
ELECTRONIC TUNER FOR A MUSICAL INSTRUMENT

Michael Anthony, 920 Cloverview, Glendora, Calif. 91740; Craig A. Ohler, Brea, Calif., and Arnold Christensen, Costa Mesa, Calif., assignors to Michael Anthony, Glendora, Calif.

Filed Nov. 27, 1989, Ser. No. 441,711

Int. Cl.[5] G10D *3/14*; G10G *7/02*

U.S. Cl. 84—312 R **23 Claims**



19. An electronic tuner for a musical instrument having a plurality of strings wherein each of said strings is vibratable at a different fundamental frequency and at integer multiple harmonic frequencies of said fundamental frequency, means for transducing vibrations on each of said strings into an electrical analog signal, and means for tensioning each of said strings to tune said fundamental frequency to an in-tune frequency associated with each of said strings, said electronic tuner comprising:

a waveshaping circuit having an input to which said analog signal is applied and an output at which a pulse train signal is developed, said pulse train signal having a plurality of successive pulses, each of said pulses having a pulse width, said analog signal being transduced from vibrations on a selected one of said strings;

a central processing unit programmed to compute a current fundamental frequency on said one of said string as a function of a ratio between a numerical count of said pulses occurring between at least two of said pulses and including one of said two of said pulses and a sum of said pulse width of each of said pulses included in said count wherein said two of said pulses have a longest pulse width of said pulses in said pulse train signal, and further to compute a difference between said current fundamental frequency and said in-tune frequency associated with said selected one of said strings;

a display which displays said difference whereby said selected one of said strings can be tuned to minimize said difference; and

a power supply to provide power to said waveshaping circuit, said central processing unit and said display, said power supply being adapted to receive a battery.

5,024,133

ELECTRONIC MUSICAL INSTRUMENT WITH IMPROVED GENERATION OF WIND INSTRUMENTS

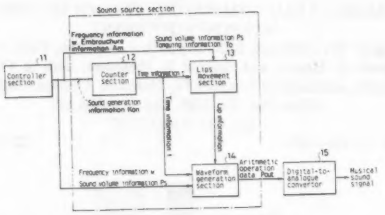
Masahiro Nakanishi, Yawata; Daisuke Mori, Kobe; Katsuyoshi Fujii, Moriguchi; Masahiko Hatanaka, Kadoma, and Hiroko Shinada, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed May 8, 1989, Ser. No. 348,526

Claims priority, application Japan, May 17, 1988, 63-119564

Int. Cl.[5] G10H *1/18, 1/46, 7/10*

U.S. Cl. 84—615 **4 Claims**



1. An electronic musical instrument comprising:

a controller section which sends out, as playing information, sound generation information Kon, frequency information w, sound volume information Ps, tonguing information To, and embouchure information Am;

a lip movement section which calculates lip information s indicating a degree of opening of lips in accordance with the playing information (To,W,Am,Ps) sent out from said controller section;

a waveform generation section which generates desired waveform data Pout in accordance with the lip information s calculated from said lip movement section and the frequency information w, and the sound volume information Ps sent out from said controller section; and

a digital-to-analog converter for making digital-to-analog conversions of the waveform data Pout sent out from said waveform generation section.

5,024,134

PITCH CONTROL DEVICE FOR ELECTRONIC STRINGED INSTRUMENT

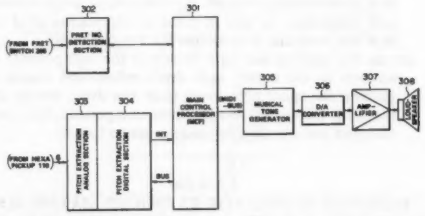
Shigeru Uchiyama, Sayama, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Apr. 28, 1989, Ser. No. 345,101

Claims priority, application Japan, May 2, 1988, 63-109625

Int. Cl.[5] G01H *1/18*

U.S. Cl. 84—654 **20 Claims**



16. An electronic apparatus in which a vibration of at least one string is detected to cause an electronic circuit to generate a corresponding acoustic wave, comprising:

vibration start detecting means for detecting a start of a vibration of said string;

first pitch determining means for, when said vibration start

detecting means detects the start of the vibration, detecting a depression position of said string to obtain an effective string length of said string and for determining a pitch of the acoustic wave the generation of which is to be started; and

second pitch determining means for, after said first pitch determining means determines the pitch of the acoustic wave when the generation of the acoustic wave is started, detecting a vibration period of said string and determining a pitch of the acoustic wave so as to sequentially change the pitch in accordance with the detected vibration period.

5,024,135

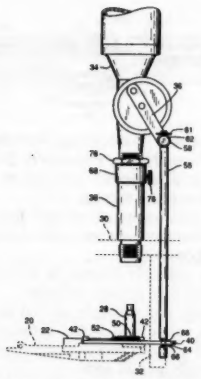
MULTI-STATION CARTRIDGE RELOADING PRESS WITH CONTROLLED POWDER DISPENSING

Walter W. Bender, Oroville, Calif., assignor to Blount, Inc., Portland, Oreg.

Filed Dec. 15, 1989, Ser. No. 451,128

Int. Cl.[5] F42B *33/02*

U.S. Cl. 86—31 **5 Claims**



1. A multiple station reloading press for reloading spend cartridges comprising:

a support bracket;

a shell plate adapted to receive a plurality of cartridge cases to be reloaded;

indexing means for moving the shell plate and thereby indexing the cartridge cases to specified reloading positions, one of said positions being a powder loading station;

a die plate mounted on said support bracket above said shell plate, reloading members mounted in the die plate at the reloading positions, one of said reloading members being a lever actuated powder dispenser for dispensing powder into a cartridge case positioned at the powder loading station;

reciprocating means for producing relative reciprocal motion between the shell plate and die plate to move them toward and away from each other, and the improvement that comprises;

a drive element connected to a lever of the powder dispenser;

connecting means for selectively interconnecting said drive element to said reciprocating means to actuate the lever and thereby dispensing powder in response to operation of the reciprocating means, said connecting means including a portion moveable between positions projected into and out of a cartridge case space to be occupied by a cartridge case positioned at the powder loading station;

said connecting means disconnecting the drive element from the reciprocating means when said portion is projected into said cartridge case space when empty, and connecting said drive element to the reciprocating means when a cartridge case occupies said cartridge case space.

5,024,136

EQUIPMENT FOR GUN LOADER

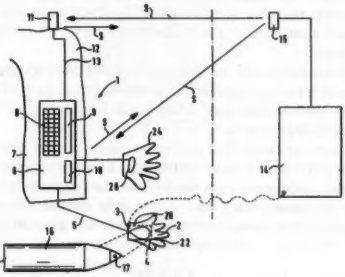
Erich Bock, Nuremberg, Fed. Rep. of Germany, assignor to DIEHL GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Mar. 22, 1990, Ser. No. 497,359

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1989, 3912287

Int. Cl.[5] F42C *17/04*

U.S. Cl. 89—6 **13 Claims**



1. Equipment for a gun loader; comprising a coil which is wire-connected to a plotting apparatus through which there can be set the fuze of an article of ammunition from the equipment of a gun layer during the loading sequence of the ammunition, said coil being fastened to a first location on equipment worn by a gun loader and in which the ammunition fuze comes into contact with said location during the loading sequence, said plotting apparatus being fastened to the equipment at a second location which is readily viewable by the gun loader, and wherein a signal transmitting path is formed between the plotting apparatus and the equipment of the gun layer.

5,024,137

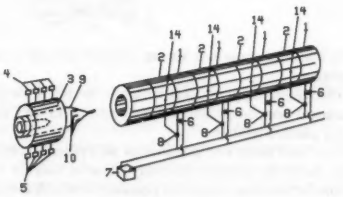
FUEL ASSISTED ELECTROMAGNETIC LAUNCHER

Jon M. Schroeder, 14301 Bagdad Rd., Leander, Tex. 78641

Filed Nov. 13, 1989, Ser. No. 435,616

Int. Cl.[5] F41B *6/00*

U.S. Cl. 89—8 **16 Claims**



1. A fuel assisted electromagnetic launcher comprising:

a) a D.C. power source,

b) a minimum of three propellant coils means each with a central opening, and each with an external series connection to said D.C. power source,

c) a nano-second switch means located in said external series connection,

d) a first capacitor means connected in parallel with lines leading to each of said minimum of three propellant coil means,

e) a primary activation means to open said nano-second

switch means as a forward tip of a cylindrical launch container means approaches said each of a minimum of three propellant coil means; said cylindrical launch container means having one con shaped end with said cone shaped end having a pointed end means and with a minimum of two thermopile ring means around said cylindrical launch container means and with said cylindrical launch container means containing a rocket fuel in a rearward compartment of said cylindrical launch container means and with said pointed end means interacting with said primary activation means to time activation of each of said propellant coil means to interact with said minimum of two thermopile means to constantly accelerate said cylindrical launch container means after said cylindrical launch container means is propelled by ignition of said rocket fuel into a gun barrel-like structure means holding said minimum of three electromagnetic propellant coils means;

f) a thermopile activation means in a structure to contain said cylindrical launch container means and align said cylindrical launch container means with an interior of said gun barrel-like structure;

g) a remote controlled guidance means in said cone shaped forward end of said cylindrical launch container means, said guidance means being furnished power by one of a group comprising said thermopile means, silicon wafer generation means, and gallium arsenide generation means.

5,024,138

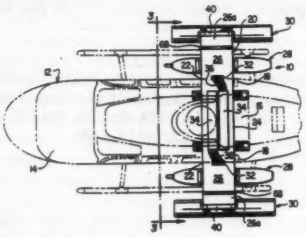
AIRCRAFT ARMAMENT APPARATUS

Paul H. Sanderson, 2019 Cripple Creek, Lewisville, Tex. 75067, and Richard C. Serkland, 1010 Meadowlake Dr., McKinney, Tex. 75069

Continuation of Ser. No. 297,970, Jan. 17, 1989, abandoned, which is a division of Ser. No. 144,873, Jan. 13, 1988, Pat. No. 4,893,545. This application Jun. 4, 1990, Ser. No. 532,172

Int. Cl.[5] F41A *23/00*

U.S. Cl. 89—37.22 **18 Claims**



1. Armament apparatus for an aircraft having a cabin area, comprising:

an elongated support plant member having a longitudinally central portion positioned between outer end portions of the plank member,

each of said outer end portions of said plank member having an outer tip portion hingedly secured thereto and pivotable between an extended position in which the tip portion defines an outward extension of said outer end portion, and a retracted position in which the tip portion is pivoted upwardly and inwardly onto said outer end portion of the plank member;

means for securing said central portion of the plank member to the aircraft, within said cabin area thereof, in a manner such that said outer end portions of said support plank member project outwardly beyond opposite side portions of the aircraft;

a pair of support structures secured to and extending downwardly from said outer tip portions for supporting weaponry, each of said support structures being pivotable relative to the plank member about a first axis generally parallel to the longitudinal axis of said plank member;

means for operatively mounting said weaponry on said support structures;

means, associated with said support structures, for pivotally adjusting the mounted weaponry about vertical axes generally perpendicular to the support plank member;

means for selectively adjusting the pivotal orientations of said support structures, about said first axis, relative to the support plank member; and

means positioned on said outer end portions of the support plank member inwardly of said outer tip portions, for operatively supporting a pair of machine guns below said plank member.

5,024,139

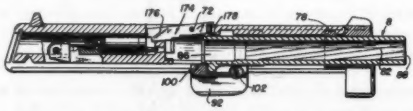
FIREARM WITH MOVABLE BARREL SAFETY

C. Reed Knight, Jr., Vero Beach, and Eugene M. Stoner, Palm City, both of Fla., assignors to Knjarmco Inc., Vero Beach, Fla.

Division of Ser. No. 447,601, Dec. 8, 1989. This application May 14, 1990, Ser. No. 523,481

Int. Cl.[5] F41A *17/66*

U.S. Cl. 89—154 **3 Claims**



1. A semi-automatic, double action only firearm comprising:

an elongated frame having a generally U-shaped, axial cavity and an axial slideway defining an upwardly facing longitudinal opening therein,

an elongated slide mounted on said frame for movement along said slideway between a slide battery position and a slide recoil position,

a drive spring assembly housed in said cavity biasing said slide into said slide battery position,

a barrel rotatably and slidingly carried in said slide,

cam means to rotate said barrel between a barrel battery position and a barrel recoil position wherein said barrel can slide axially in said slide,

integral lugs that extend laterally from said barrel to prevent its axial movement in said slide when in said barrel battery position,

a firing pin assembly including a firing pin carried in said slide for axial movement between a retracted position and a firing position through a safety position, and

a firing pin safety block assembly that positively prevents said firing pin from reaching said firing position until said barrel has fully rotated into said barrel battery position including a stop lever pivoted on said slide.

5,024,140

HYDRAULIC CONTROL MECHANISM FOR A HYDRAULIC ACTUATOR

Douglas M. Gage, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Oct. 30, 1989, Ser. No. 429,442

Int. Cl.[5] F15B *13/04*

U.S. Cl. 91—28 **13 Claims**

1. A hydraulic control mechanism comprising:

a first source of pressurized hydraulic fluid;

a hydraulic actuator;

a first hydraulic line hydraulically coupling the first source to the hydraulic actuator;

a pilot signal line for transmitting a hydraulic pilot signal, the pilot signal line having a pilot pressure sensing point;

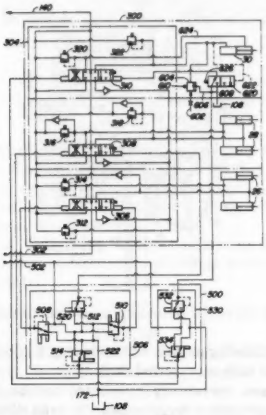
a pilot operated hydraulic control valve hydraulically positioned between the first source and the hydraulic actuator

on the first hydraulic line, the hydraulic control valve regulating the flow of hydraulic fluid from the first source to the hydraulic actuator, the hydraulic control valve having at least one end cap hydraulically coupled to the pilot signal line for positioning the hydraulic control valve in response to a pilot signal;

a second source of pressurized hydraulic fluid;

a second hydraulic line hydraulically coupling the second source to the hydraulic actuator;

a first pressure sensing valve hydraulically positioned between the second source and the hydraulic actuator on the second hydraulic line, the first pressure sensing valve regulating the flow of hydraulic fluid from the second source to the hydraulic actuator, the first pressure sensing valve is provided with a first pressure sensing line that is



hydraulically coupled to the pilot signal line at the pilot pressure sensing point for positioning the first pressure sensing valve in response to a pilot signal; and

a second pressure sensing valve hydraulically positioned between the sensing point on the pilot sensing line and the at least one end cap of the hydraulic control valve for coupling and decoupling the pilot signal to the end cap of the hydraulic control valve, the second pressure sensing valve is provided with a second pressure sensing line that is hydraulically coupled to the first hydraulic line for driving the second pressure sensing valve in response to the hydraulic pressure in the first hydraulic line, whereby when hydraulic pressure increases in the first hydraulic line the second pressure sensing valve shifts decoupling the at least one end cap of the hydraulic control valve from the pilot pressure signal.

5,024,141

METHOD FOR THE SYNCHRONOUS OPERATION OF JUXTAPOSED CYLINDER DEVICES

Hiroyuki Kawada, Hekinan, Japan, assignor to Sugiyasu Industries Co., Ltd., Aichi, Japan

Filed May 9, 1989, Ser. No. 349,253

Claims priority, application Japan, Nov. 10, 1988, 63-146815[U]

Int. Cl.[5] F01B *25/04;* **F15B** *11/22;* **G01B** *7/14*

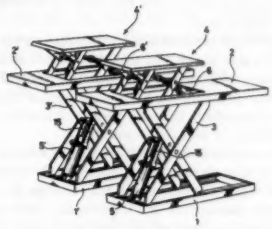
U.S. Cl. 91—171 **11 Claims**

1. A method for synchronizing the operations of plural cylinder devices, each including a reciprocating part and a stationary part, which comprises

(a) providing one of said two parts of each said cylinder device with a scale having alternate projections and depressions which are arranged with regular pitches along a direction of reciprocation of said reciprocating part, as well as providing the other of said two parts at a given position thereof with a sensor that determines whether a portion of said scale which corresponds to said sensor in position at a particular point of time is a projection or a depression, said sensor producing pulses while making said determination,

(b) monitoring a pattern of the pulses produced by the sensor of each of the cylinder devices while the cylinder devices are operating,

(c) determining that the operations of the cylinder devices



have become unsynchronized, if and when the relative patterns of occurrence of the pulses produced by the sensors disagree with the relative patterns of occurrence of pulses produced by the sensors when the cylinder devices are in synchronous operation, by more than a predetermined degree, and

(d) controlling the rate of supply of operating fluids to the cylinder devices until the disagreement of the relative patterns of the pulses has been eliminated, thereby synchronizing the operations of the cylinder devices.

5,024,142

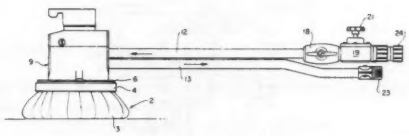
CYCLICALLY OPERATING FLUID DRIVE MOTOR WITH MAGNETICALLY CONTROLLED DIAPHRAGM VALVES

Thomas Vrhel, Sr., 5782 Barnswell Way, San Jose, Calif. 95138, and Thomas Vrhel, Jr., 918 Clinton Rd., Los Altos, Calif. 94024

Filed Jul. 24, 1989, Ser. No. 384,323

Int. Cl.[5] F01L *25/08*

U.S. Cl. 91—271 **5 Claims**



1. A fluid drive motor for producing rotary reciprocating motion, comprising:

a) a motor body arranged about a longitudinal axis and having fluid ingress and egress passageways including fluid distribution ports communicating with a pair of opposed piston cavities formed within the motor body and closed at their adjacent ends by a transverse wall and closed at their remote ends by seal walls detachably secured to the motor body;

b) a piston assembly mounted within the motor body and including a double-acting pair of pistons slidably disposed sealingly in said pair of opposed piston cavities, and a toothed rack interconnecting said pistons on opposite sides of said transverse wall;

c) a drive assembly mounted on said motor body and including an elongated drive shaft extending through said body transverse to the longitudinal axis thereof and having a pinion gear fixed thereon operatively engaged with said

toothed rack whereby axial reciprocation of said piston assembly including said toothed rack effects rotary reciprocation of said drive assembly including said elongated drive shaft;

d) fluid distribution means mounted on said motor body for directing fluid alternatively to and from each of said piston cavities to effect axial reciprocation of said pistons within said piston cavities and including a fluid channel block having ports communicating with said fluid distribution ports in the motor body and a valve block operatively associated with said channel block and having valve means operable to control the flow of fluid through said channel block; and

e) a non-electrical control mechanism operatively associated with said valve block and said drive shaft and operable in cooperation with said valve means to control the flow of fluid under pressure through said motor body to effect axial reciprocation of said piston assembly and rotary reciprocation of said drive assembly;

f) said valve means including two pairs of diaphragm valves, one valve of each pair being open for the passage of fluid therepast while the remaining valve of each pair is closed to prevent passage of fluid therepast, one of said open valves admitting fluid under pressure to one of said piston cavities to effect displacement of the piston therein while the other open valve enables fluid to be discharged from the other of said piston cavities by displacement of the piston therein.

5,024,143

SWASHPLATE TYPE HYDRAULIC AXIAL PISTON MACHINE HAVING A TRACKING DEVICE FOR THE CAGE OF THE SEGMENTAL ROLLING CONTACT BEARING OF THE SWASHPLATE

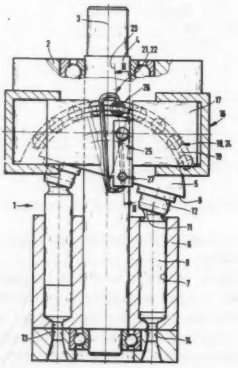
Reinhold Schniederjan, Neu-Ulm, Fed. Rep. of Germany, assignor to Hydromatik GmbH, Fed. Rep. of Germany

Filed May 15, 1990, Ser. No. 523,770

Claims priority, application Fed. Rep. of Germany, May 16, 1989, 3915904

Int. Cl.[5] F01B *3/02*

U.S. Cl. 92—12.2 **11 Claims**



1. A swashplate type hydraulic axial piston machine wherein the swashplate is arranged on a rocker mounted to pivot in a segmental rolling contact bearing, said machine having a tracking device for the cage of said pivot bearing which comprises a rod-like guide element which is connected to said rocker in a first bearing in the rocker so that it can pivot parallel to the pivot plane and is connected to said cage in a second bearing so that it can pivot parallel to the pivot plane and can be displaced longitudinally, and is mounted to pivot parallel to the pivot plane in a third bearing, characterised in that said rocker can be adjusted by an adjustment member mounted so that it can be displaced transverse to the middle axis of the axial piston machine and that said third bearing is arranged on a guide member which is movably connected to the adjustment member and the rocker.

5,024,144

PISTON DRIVE

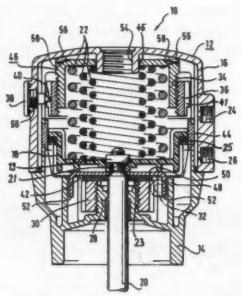
Fritz Müller, Neuer Wasen 6, 7118, Ingelfinger-Criesbach, Fed. Rep. of Germany

Filed Aug. 18, 1989, Ser. No. 395,486

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1988, 3829566

Int. Cl.[5] F01B *31/14*

U.S. Cl. 92—13.5 **13 Claims**



1. A piston drive for actuating an element such as a valve, comprising:

a housing defining an axis and including a connecting piece provided with an external thread;

piston means operatively connected to the element and including a piston reciprocating in axial direction within said housing between two end positions;

first adjusting means for defining one of said end positions of said piston, said first adjusting means including a worm drive having a worm wheel acting upon said piston and provided with an internal thread in mesh with said external thread of said connecting piece so as to be movable in axial direction; and

second adjusting means accommodated in said housing for defining the other one of said end positions, said second adjusting means including a further connecting piece mounted to said housing and a gear extending in the path of movement of said piston and cooperating with said further connecting piece so as to be movable in axial direction, said gear being accessible from outside through an opening of said housing to permit adjustment thereof.

5,024,145

VIBRATORY BULK MATERIAL PROCESSOR AND METHOD

Richard G. Bailey, Overland Park, Kans., assignor to Flakee Mills, Inc., Lincoln, Nebr.

Filed Aug. 28, 1989, Ser. No. 399,258

Int. Cl.[5] A23L *3/26*; F26B *23/08*

U.S. Cl. 99—451 **24 Claims**

1. A bulk material radiation processor, which includes:

(a) a framework assembly;

(b) a tray assembly, which includes:

(1) a pair of transversely-spaced side walls;

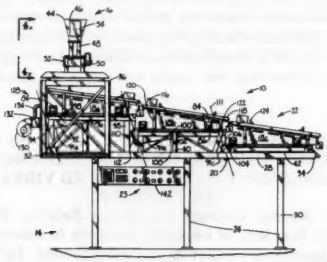
(2) an upper plate extending transversely between said side walls and including a material-receiving upper surface and longitudinally-spaced upstream and downstream ends;

(3) a lower plate extending transversely between said side walls and including a material-receiving upper surface

and longitudinally-spaced upstream and downstream ends;

(4) longitudinally-spaced upstream and downstream tray assembly ends;

(5) a material flow path from said tray assembly upstream end to said tray assembly downstream end over said plate material-receiving upper surfaces and between said tray assembly side walls; and



(6) mounting means for mounting said tray assembly on said framework assembly;

(c) a vibrator operably connected to said tray assembly;

(d) an infrared heater mounted on said frame assembly over said material flow path; and

(e) vibration dampening means comprising a pneumatic shock absorber connected to said frame assembly and said tray assembly.

5,024,146

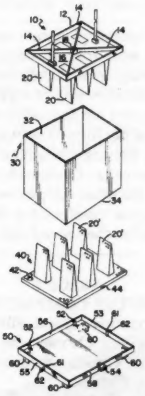
CHEESE DRAINER PAN ASSEMBLY

Gordon L. Dull, Soldiers Grove, Wis., assignor to Wisconsin Dairies Cooperative, Baraboo, Wis.

Filed Mar. 19, 1990, Ser. No. 495,686

Int. Cl.[5] A01J *25/00;* **A23C** *19/00*

U.S. Cl. 99—458 **11 Claims**



1. A drainer pan assembly for large-scale cheese making comprising:

a pan having a drainer plate disposed therein and means for securely attaching said plate to said pan; wherein said attachment means comprises a plurality of restraints, including at least one releasable restraint, which secure said plate to said pan and are arranged with respect to each other so that when the releasable restraint is released said plate is easily removed from said pan and when engaged said plate is secured in said pan; wherein said releasable restraint comprises a dowel and spring means for urging said dowel into releasable engagement with said drainer plate and said dowel and spring means are associated with the pan.

5,024,147

DEVICE FOR PITTING FRUIT, PARTICULARLY PRUNES

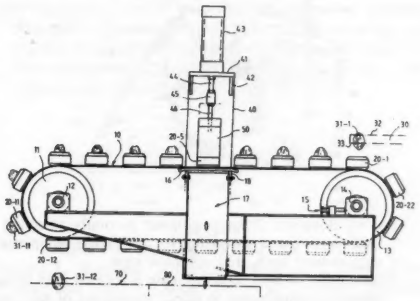
Gaston Petit, 8, rue des Coquelicots, 95000 Cergy, and Daniel Monteiro, Hautefage La Tour, 47340, La Roque Timbaut, both of France

Filed Jun. 30, 1988, Ser. No. 213,812

Claims priority, application France, Nov. 5, 1986, 86 15416; Jun. 4, 1987, 87 07828

Int. Cl.[5] A23N *4/00, 4/08*

U.S. Cl. 99—549 **17 Claims**



1. A fruit-pitting device, particularly for prunes, comprising means for actuating a pitting rod (**46**), so that it goes down in a holding position where a prune is held, characterized in that said holding position is defined by an annular trough (**20**) for collecting and holding a prune in a substantially vertical position, and by a sleeve (**50**) mounted slidingly along said rod (**46**) and carried therewith under the effect of an elastic return in compression within said sleeve (**50**) when said prune is in said holding position, said sleeve (**50**) having hallowed-out free end (**60**) at the trough end and disposed opposite thereto, said trough end of said sleeve contacting said trough when said prune is in said holding position and said elastic return is compressed.

5,024,148

COATING REMOVAL DEVICE FOR GRANULAR MATERIALS

Darcy Moses, Rush City, Minn., assignor to Crown Iron Works Company, Minneapolis, Minn.

Filed Oct. 5, 1988, Ser. No. 253,769

Int. Cl.[5] B02B *3/00, 3/04*

U.S. Cl. 99—618 **7 Claims**

1. Apparatus for removing skin-like coatings from nuclei of a material to be processed, which nuclei the coatings encase, comprising:

(a) a housing including a pair of opposite, generally-parallel side panels;

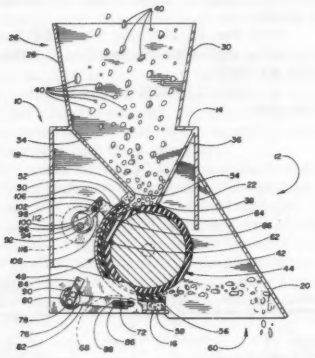
(b) a drum disposed between said housing side panels for rotation about an axis, said drum having an outwardly facing surface;

(c) an arcuate wall disposed between said housing side panels and positioned such that an inner concave surface of said wall is disposed closely proximate said outwardly facing surface of said drum to define a narrow processing space between said inner concave surface of said wall and said outwardly facing surface of said drum, said processing space narrowing downwardly along said outwardly facing surface of said drum;

(d) means mounting said wall to enable variation of the distance at which said wall is disposed proximate said drum, said mounting means including:

(i) a shackle secured to an outer convex surface of said wall proximate a lower end thereof;

(ii) an eccentric cam mounted to one of said housing side panels and disposed for rotation about an axis generally perpendicular to said housing side panel to which said cam is mounted; and



(iii) an elongated linkage member pivotally attached to said shackle and extending to, and being in operative engagement with, said eccentric cam;

(iv) wherein, as said eccentric cam is rotated, said linkage member reciprocates to effect movement of said wall; and

(e) means for introducing material to be processed into said processing space.

5,024,149

BINDING STRAP OPERATING APPARATUS

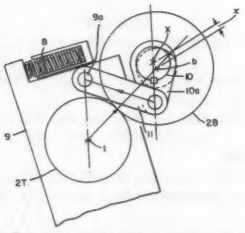
Kanami Kato, Saiai, Japan, assignor to Signode Corporation, Glenview, Ill.

Filed Apr. 10, 1989, Ser. No. 335,956

Claims priority, application Japan, Apr. 15, 1989, 63-94337

Int. Cl.[5] B65B *13/22*

U.S. Cl. 100—32 **10 Claims**



1. Apparatus for feeding, taking up, and tensioning a binding strap, comprising:

a traction wheel;

a back-up wheel operatively associated with said traction wheel for defining a gap therebetween within which a portion of said binding strap can be disposed for movement in a forward feeding and reversed retraction directions so as to achieve feeding and tensioning binding operations;

a pivotable support plate upon which one of said traction and back-up wheels is mounted;

means for eccentrically mounting the other one of said traction and back-up wheels such that said two wheels can relatively approach, and separate from, each other so as to respectively retain said binding strap within said gap, and permit introduction of said binding strap into said gap;

lever means connected to said means for eccentrically mounting said other one of said traction and back-up wheels;

connecting link means for connecting said lever means to said support plate; and

spring means for biasing said support plate in a direction which will cause said eccentrically mounted wheel to be moved toward said one of said wheels in response to the biasing force of said spring means being transmitted to said eccentrically mounting means through said support plate, said connecting link means, and said lever means.

5,024,150

PROCESS FOR REDUCING VIBRATIONS OF SUCCESSIVE SETS OF ROLLS AND A ROLL ARRANGEMENT HAVING REDUCED VIBRATORY TENDENCIES

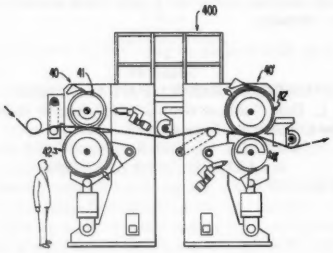
Berhard Brendel, Grefrath and Günter Schrörs, Tönisvorst, both of Fed. Rep. of Germany, assignors to Eduard Küsters Maschinenfabrik GMBH & Co. KG., Krefeld, Fed. Rep. of Germany

Filed May 8, 1989, Ser. No. 349,042

Claims priority, application Fed. Rep. of Germany, May 6, 1988, 3815445

Int. Cl.[5] B30B *3/04, 13/00*

U.S. Cl. 100—35 **18 Claims**



1. A process for reducing vibrations of at least first and second pairs of rolls, each roll pair being of essentially similar construction and being immediately successive and spaced from each other in the direction of travel of a web, which is conducted through a first nip formed between rolls of the first roll pair and a second nip formed between rolls of the second roll pair, comprising altering the natural frequency of the one of the first and second pairs of rolls such that it differs from the natural frequency of the other roll pair whereby random vibrations of the first roll pair manifested in the web do not form a systematic excitation for the second roll pair.

5,024,151

REFUSE COMPACTOR

Guy Girardin, Ste Foy; Pierre Morin, Sillery; Duy Nguyen; Duc Nguyen, both of St Jean Chrysostome, and Louise Brunelle, Charlesbourg, all of Canada, assignors to Les Enterprises Julien Inc., Quebec, Canada

Filed May 31, 1989, Ser. No. 359,439

Int. Cl.[5] B30B *15/14*

U.S. Cl. 100—53 **17 Claims**

1. A refuse compactor comprising:

a cabinet defining a refuse-compaction chamber and having a front wall and two opposite side walls, and a service door to give access to the compactor chamber through its front wall;

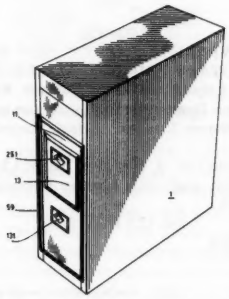
a compaction mechanism mounted in the cabinet above the compaction chamber to compact refuse in a container

removeably insertable into said compaction chamber through the service door;

a pressure-resisting wall penal moveably mounted inside said compaction chamber, said wall panel being adjacent and parallel to one of said side walls of said compaction chamber;

cam means mounted inside the compaction chamber, said cam means being capable of laterally moving the wall panel toward and away from the one side wall;

actuation means mechanically connected to the cam means to operate the same in order to reversibly move the wall panel between a first position where said wall panel is rigidly held at a distance from the one side wall of the



compaction chamber and a second position where said wall panel extends close to said one side wall;

said service door being pivotally mounted onto said front wall about a set of hinges;

said cam means including opposite wedges fixed on said one side wall and said wall panel respectively in such a manner as to allow bodily motion of said wall panel toward and away from said one side wall when said wall panel is shifted perpendicularly to said front wall; and

said actuation means including means connecting said service door and said wall panel together to mechanically shift said wall panel perpendicularly to said front wall as soon as said service door actuated.

5,024,152

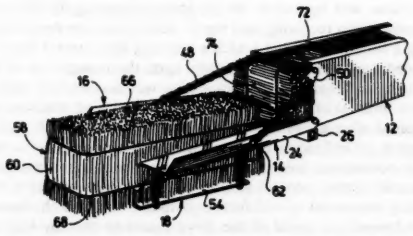
QUARTER TURN BALE DISCHARGE APPARATUS

David E. Girard, Goessel, Kans., assignor to Hay & Forage Industries, Hesston, Kans.

Filed May 14, 1990, Ser. No. 523,016

Int. Cl.[5] B30B *1/00;* **A01D** *75/00;* **B65G** *11/00*

U.S. Cl. 100—188 R **10 Claims**



1. A bale discharge apparatus for use in guiding each of a plurality of bales of crop material between a bale forming chamber of a baler and the ground as each of the bales is delivered from the bale forming chamber, wherein each bale is of a generally parallelepipedal shape having a predetermined height and width and defining top and bottom sides, lateral sides, and front and rear ends, the bale chute apparatus including a bale turning assembly for turning each bale onto one of the lateral sides as the bale is delivered along a predetermined path from the bale forming chamber, wherein the improvement comprises:

a table for receiving each turned bale after the bale has been turned onto one of the lateral sides by the bale turning assembly; and

means for supporting the table beneath the bale turning assembly at a height adapted to position the turned bale at least partially within the predetermined path of the next delivered bale so that the front end of the next delivered bale engages the rear end of the turned bale and pushed the turned bale from the table onto the ground,

said supporting means including flexible means yieldably suspending the table beneath the turning assembly in a manner to permit the table to freely rise and fall and rock fore-and-aft and side-to-side as necessary to slide over obstructions in the field.

5,024,153

PRINT DRUM FOR A POSTAGE METER

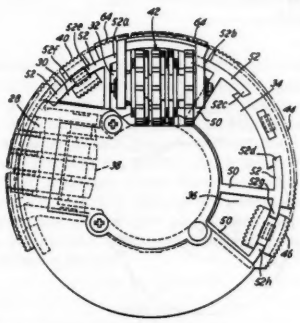
Raymond L. Bannister, Richmond; Frederick C. Close, Great Amwell, and Peter J. Loeber, Earith, all of United Kingdom, assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Sep. 10, 1986, Ser. No. 905,896

Claims priority, application United Kingdom, Sep. 16, 1985, 8522831

Int. Cl.[5] B41F *13/10, 27/06*

U.S. Cl. 101—91 **15 Claims**



1. A print drum for a postage meter, comprising:

a drum structure defining a drum longitudinal axis, an outwardly facing print region and a plurality of recesses within said printing region,

a print wheel assembly housed within said drum structure having means for remotely adjusting the print wheels of said assembly,

longitudinal guide means associated with said recesses,

at least one imprinting die constructed for sliding movement on said longitudinal guide means in and out of one of said recesses in a direction substantially parallel to said print drum axis, and

resilient biassed detent means for releasably locking the imprinting die in its printing position within the respective drum recess.

5,024,154

TRANSFER ROLLER SWITCHING MECHANISMS OF INK AND WATER SUPPLY APPARATUS FOR USE IN PRINTING PRESSES

Kiyoshi Ito, Imba, Japan, assignor to Komori Printing Machinery Co., Ltd., Tokyo, Japan

Filed Feb. 17, 1981, Ser. No. 235,421

Claims priority, application Japan, Feb. 28, 1980, 55-25054

Int. Cl.[5] B40L *23/00*

U.S. Cl. 101—148 3 Claims

1. A transfer roller switching mechanism of ink and/or water supply apparatus for use in a printing press comprising a fountain roller for supplying ink or water, a swinging roller for supplying ink or water to a plate cylinder, a rubber cylinder brought into engagement with said plate cylinder and out of engagement therefrom, a transfer roller reciprocated between said fountain roller and said swinging roller, a swinging lever which is swung together with a supporting member of said transfer roller, a control member pivoted to said swinging lever near a free end thereof and interlocked with movements of said rubber cylinder into engagement and disengagement from said rubber cylinder so as to prevent swinging motion of said swinging lever, manual switching means for switching said control member between a position at which the movement of said swinging lever is prevented and a position at which said swinging lever is permitted to move, and buffer spring means interposed between said plate cylinder and said control member for transmitting motion therebetween and for enabling said rubber cylinder to disengage from said plate cylinder when said control member is fixed.

5,024,155

FINGER PROTECTING ELEMENT FOR CYLINDER NIP

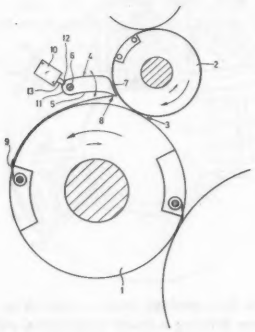
Hans-Georg Jahn, Wiesenbach, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Apr. 9, 1987, Ser. No. 36,351

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1986, 3613463

Int. Cl.[5] B41F *33/00*

U.S. Cl. 101—216 8 Claims



1. In combination, a printing machine with counter-rotating cylinders having a nip therebetween formed with a sheet inlet and a sheet outlet, and means for gripping a leading edge of a sheet and transporting the sheet from one of the cylinders to the other of the cylinders successively through the sheet inlet and the sheet outlet of the nip, and a device comprising a finger protecting element pivotally mounted at an end thereof on a shaft extending parallel to axes of the cylinders in a danger zone in front of the sheet outlet of the nip, said finger protecting element having a guide surface on a side thereof facing towards the other cylinder for guiding a displaced trailing edge of the sheet after the sheet has been transported from the one cylinder to the other, said guide surface beginning at the other and free end of the finger protecting element in vicinity of the sheet outlet of the nip and extending towards said pivotally mounted end, said guide surface being concave and being spaced from the other cylinder, said concave guide surface being disposed approximately equidistantly from the circumference of the other cylinder.

5,024,156

SAFETY DEVICE FOR THE CONTROL OF WEB-FED ROTARY PRINTING MACHINES

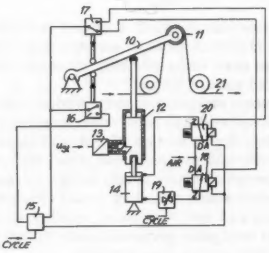
Dietrich Hank, Leipzig, and Jürgen Gottlebe, Karl-Marx-Stadt, both of German Democratic Rep., assignors to Veb Kombinat Polygraph "Werner Lamberz" Leipzig, Leipzig, Fed. Rep. of Germany

Filed Oct. 3, 1986, Ser. No. 915,312

Claims priority, application German Democratic Rep., Dec. 13, 1985, 284283

Int. Cl.[5] B41F *5/00*

U.S. Cl. 101—216 9 Claims



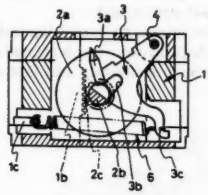
1. A safety device for a control of a web-fed rotary printing machine including a printing means, a device for advancing a web having a predetermined tension past the printing means, drive means for driving the web advancing device to advance the web at a predetermined speed, waste paper removing means, and a central control station for controlling the printing press, said safety device comprising sensors positioned at least before and behind the web advancing device and operative for recognizing tears in a region of edges of the advancing web; an evaluation device having an input connected to said sensors and an output, at which an impulse-like control signal Ust, indicative of recognizing a tear in said web by said sensors, is issued; switching means connected to said output of said evaluation device and arranged in a path of said web of the printing machine and operative for an abrupt lowering of the web tension upon receiving said signal; said evaluation device having a further output at which a warning and control signal is issued, said signal starting timely upon the recognition of the tear at said region of the advancing web and ending when a time interval of a machine cycle of the printing machine has expired after a last recognition of a tear to the web at said region; an indication element for indicating danger of a web tear occurrence, said indication element being positioned at a central remote control station of the printing machine and being connected to said further output, a first switch element for lowering a speed of the drive means to thereby lower a speed of the advancing web and a second switch element for actuating the waste removing means, said first and second switch elements being connected to said further output.

5,024,157

SHOCK DETECTING DEVICE

Masumi Nishikawa, Toyoake, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 13, 1990, Ser. No. 492,750
Claims priority, application Japan, Mar. 23, 1989, 1-71567
Int. Cl.[5] F42C 15/24
U.S. Cl. 102—252 10 Claims



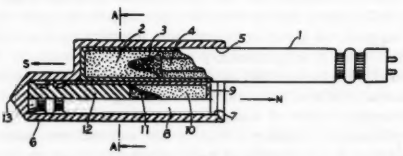
1. A shock detecting device, comprising:
a housing;
a firing lever pivotably mounted in the housing to rotate in a first direction from a cocked to a fired position;
urging means interposed between the firing lever and the housing for constantly urging rotation of the firing lever in the first direction to the fired position; and
a weight, including a cam, rotatably and slidably mounted in the housing, said weight being caused to rotate and slide in response to an external shock which exceeds a predetermined amount of force, the cam engaging the firing lever when in a cocked position and disengaging the firing lever to permit rotation of the firing lever in the first direction to the fired position in response to the rotation and sliding movement of the weight in response to an external shock.

5,024,158

MULTI-DIRECTIONAL INITIATOR FOR EXPLOSIVES

David L. Kennedy, Victoria, Australia; Donald C. True, Brownsburg, and David M. Welsh, South Brownsburg, both of Canada, assignors to Imperial Chemical Industries PLC, England

Division of Ser. No. 305,922, Feb. 3, 1989, Pat. No. 4,947,751.
This application May 17, 1990, Ser. No. 524,475
Claims priority, application United Kingdom, Feb. 3, 1988, 8802328
Int. Cl.[5] C06C 5/06
U.S. Cl. 102—275.11 4 Claims



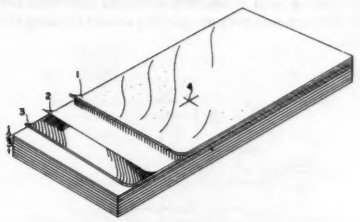
1. An initiator assembly suitable for use in detonating a column of cap-sensitive water-gel emulsion or pneumatically loaded ANFO explosives, comprising two blasting caps each containing an ignition charge of primary explosives material and a base charge of secondary explosives material, said caps being secured together side-by-side such that the base charge end of the first cap is at one end of the assembly and the base charge end of the second cap is at the opposite end of the assembly and the ignition charges are co-incident over a portion of the length of the assembly so that initiation of the ignition charge of the first cap causes substantially simultaneous initiation of the ignition charge in the second cap.

5,024,159

PLANE-WAVE FORMING SHEET EXPLOSIVE

David H. Walley, P.O. Box 396, Muskogee, Okla. 74402

Filed May 14, 1987, Ser. No. 49,547
Int. Cl.[5] C06D 00/00
U.S. Cl. 102—289 16 Claims



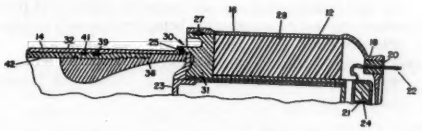
1. A point initiated geometric waveforming flexible explosive sheet comprising:
a recurring sequence of alternating layers of explosive, foil, and a spacer forming material in order.

5,024,160

RAPID BURNING PROPELLANT CHARGE FOR AUTOMOBILE AIR BAG INFLATORS, ROCKET MOTORS, AND IGNITERS THEREFOR

J. B. Canterberry, Taft, Tenn., and David A. Flanigan, Ogden, Utah, assignors to Thiokol Corporation, Ogden, Utah

Division of Ser. No. 908,763, Sep. 18, 1986, Pat. No. 4,798,142.
This application Feb. 11, 1988, Ser. No. 158,829
Int. Cl.[5] B60R 21/28; F42B 3/00
U.S. Cl. 102—323 9 Claims



1. Apparatus comprising a vehicle inflatable crash protection bag means, a gas generant charge which is operable upon ignition to produce gas, said gas generant charge includes a reticulated substrate having a quantity of interconnected ligaments and a coating of solid gas generant composition on said ligaments, said coating has a thickness such that interstices are between coated ligaments which interstices define open gas generant surface area for supporting combustion, ignition means to ignite said gas generant composition, and means for flowing the gas into said vehicle inflatable crash protection bag means for inflation thereof.

5,024,161

MOLDING APPARATUS

Kurt Fischer, and Georges Louys, both of Schaffhausen, Switzerland, assignors to Georg Fischer AG, Schaffhausen, Switzerland

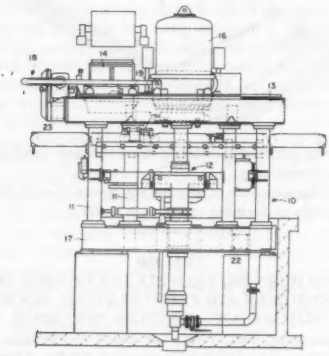
Continuation of Ser. No. 14,094, Jan. 29, 1987, abandoned, which is a continuation of Ser. No. 748,739, Jun. 25, 1988, abandoned. This application Jan. 26, 1988, Ser. No. 149,975
Claims priority, application Switzerland, Jun. 25, 1984, 3046/84
Int. Cl.[5] B22C 15/00
U.S. Cl. 164—149 12 Claims

1. A forming apparatus for the manufacture of casting molds by means of a pressure shock wave from a gaseous medium, comprising,
a structural frame, said structural frame comprising columns, upper cross beams and longitudinal beams,

a forming combination within said structural frame,

means for producing a pressure shock wave located above said forming combination, said means including an enclosed pressure vessel containing a supply of a pressurized gas supported by said upper cross beams of said structural frame,

a filling vessel having a bottom opening and being operable for holding sand or another moldable substance for delivery through said bottom opening to said forming combination,



said filling vessel being located above said forming combination and supported by said upper cross beams of said structural frame, wherein the topmost edges of said cross beams supporting said filling vessel lie in substantially the same plane as the bottom of said filling vessel, and

guide rails connected to said upper cross beams for supporting said filling vessel and said pressure vessel, said filling vessel and said pressure vessel being horizontally displaceable along said guide rails,

said structural frame being arranged so that the center of gravity of said structural frame is within said forming combination.

5,024,162

CABLE TRANSPORT APPARATUS

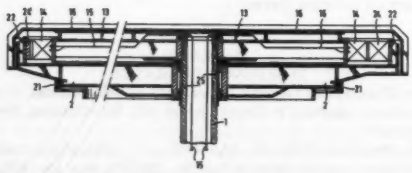
Ernst Nigg, and Elmar B. Fuchs, both of Schwarzach, Austria, assignors to Konrad Doppelmayr & Sohn Maschinenfabrik Gesellschaft m.b.H. & Co. KG, Wolfurt, Austria

Filed Feb. 2, 1990, Ser. No. 474,457

Claims priority, application Austria, Feb. 8, 1989, 267/89

Int. Cl.[5] B61B *12/10*

U.S. Cl. 104—178 **4 Claims**



1. A cable railway having at least one station, a cable and at least one carrier displaceable on said cable, said station comprising:

a housing formed with a support;

an inner ring mounted on said support in said housing and having an axis, said inner ring being formed with an outer periphery provided with a first plurality of magnets spaced angularly from one another on said outer periphery;

an outer ring mounted rotatably on said support and coaxial with said inner ring, said outer ring being formed with a flange extending parallel to said axis, said flange being formed with an inner peripheral surface and an outer peripheral surface, said inner peripheral surface being juxtaposed with said outer periphery of said inner ring and carrying a second plurality of magnets spaced angularly and juxtaposed with said first plurality of magnets, said outer peripheral surface of said outer ring being formed with means for guiding said cable transporting said carrier to or from said station; and

circuit means for selectively energizing said first plurality of magnets, so that said outer ring is rotated causing the cable to be driven upon energizing said first plurality of magnets.

5,024,163

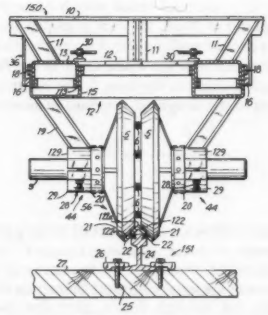
DERAILMENT RESISTING, TRACTIVE POWER RAILWAY SYSTEM

Erwin Lenz, 180 Cabrini Blvd., New York, N.Y. 10033

Continuation-in-part of Ser. No. 240,036, Sep. 2, 1988, Pat. No. 4,947,646. This application Mar. 5, 1990, Ser. No. 488,666

Int. Cl.[5] B61C *11/00, 15/02*

U.S. Cl. 105—73 **10 Claims**



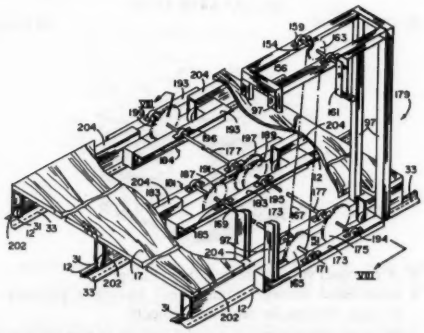
1. In a conventional railroad system comprising a pair of standard railroad rails and a standard railroad car riding along said rails, the improvement which comprises a supplementary central rail secured intermediate the pair of conventional railroad rails, the supplementary rail comprising a vertical support secured intermediate the two conventional rails and a pair of upwardly facing slanted track surfaces supported by the vertical support, the slanted track surfaces intersecting at a central portion of the supplementary rail; and, independently suspended from the railroad car, a supplementary traction wheel, separately secured to the railroad car along a line intermediate conventional pairs of wheels; a support system securing the supplementary traction wheel to the railroad car independently of the conventional pairs of wheels, so as to permit rotation about the horizontal axis of the supplementary traction wheel, limited vertical movement, and at least limited rotation about a vertical axis of the support system, the support system comprising horizontal axle means permitting rotation of the supplementary traction wheel about its horizontal axis, and vertical support means rotatably and slidably connected to the railroad car so as to permit rotation about the vertical axis and limited longitudinal motion along the vertical axis; the supplementary traction wheel comprising a pair of intersecting conical circumferential surfaces so juxtaposed as to mate with the slanting track surfaces when the conventional wheels are riding on the conventional rails.

5,024,164

MOBILE STORAGE SYSTEM WITH IMPROVED DRIVING ASSEMBLIES

Alan R. Leist, Grand Rapids, Mich., assignor to Pipp Mobile Systems, Inc., Grand Rapids, Mich.

Division of Ser. No. 162,644, Feb. 29, 1988, Pat. No. 4,944,231.
This application Jun. 4, 1990, Ser. No. 533,082
Int. Cl.[5] B61C *11/04*
U.S. Cl. 105—101 15 Claims



1. A mobile storage system for movably supporting at least one mobile storage unit, wherein said system comprises:

at least three spaced apart track members including first and second outer track members and an inner track member disposed intermediate said outer track members positioned in parallel relationships with each other, each track member being formed as a unitary piece and including an upper surface having a series of openings which are aligned longitudinally along the length of each track member;

a plurality of support structures including first and second outer support structures and an inner support structure wherein one support structure is movably mounted upon each said track member for movement along the length of its respective track member, each support structure including means for supporting the mobile storage unit;

a first axle rotatably mounted to said support structures extending transversely across said first outer track member, said inner track member and said second outer track member;

a plurality of driving sprockets wherein at least one driving sprocket is fixedly mounted on said first axle for co-rotation therewith, each of said driving sprockets disposed in adjacency to one of said track members and having teeth in driving engagement with the series of openings in the track member;

a drive shaft extending substantially parallel to said first axle having a first end portion rotatably mounted to said first outer support structure and a second end portion rotatably mounted to said inner support structure;

first drive means disposed adjacent said first outer support structure for rotating said first end portion of said drive shaft; and

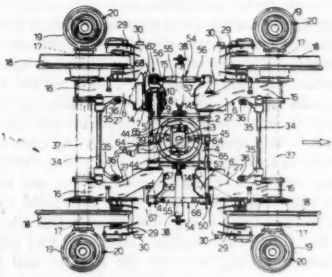
second drive means in operative association with said second end portion of said drive shaft and with the midsection of said first axle, whereby rotation of said drive shaft is drivingly transmitted to the midsection of said first axle and said driving sprockets are rotated so that said mobile storage unit is moved along the lengths of said track members.

5,024,165

SELF-STEERING BOGIE FOR A RAILWAY VEHICLE

Romano Panagin, Turin, Italy, assignor to Fiat Ferroviaria S.p.A., Turin, Italy

Filed Oct. 11, 1989, Ser. No. 419,675
Claims priority, application Italy, Oct. 14, 1988, 67921 A/88
Int. Cl.[5] B61F *5/44*
U.S. Cl. 105—168 10 Claims



1. A bogie having independent wheels for a railway vehicle, comprising:

a central support structure;

four independent arms carrying respective axles of the wheels;

resilient bushes for respectively articulating said arms to said support structure, two on one side and two on an opposite side, said resilient bushes respectively having horizontal axes extending transversely with respect to said bogie;

suspension means for suspending a body of the vehicle;

a center casting fixed to said support structure with the possibility of relative rotation about its vertical axis and adapted to be fixed rigidly to said vehicle body; and

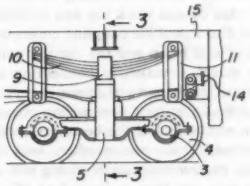
a steering control device for steering said axles, said steering control device including at least one pair of linear actuators disposed longitudinally along the sides of said support structure and connected at their ends to said articulated arms of the corresponding side of said support structure, and means for actuating said linear actuators by a relative rotation between said bogie and said vehicle body, said linear actuators including at least one screw and nut pair means for producing a steering action.

5,024,166

BOGIE FOR RAIL VEHICLES

Günter Ahlborn, Siegen; Herbert Büdenbender, Netphen, and Alfred Lohmann, Siegen-Eisern, all of Fed. Rep. of Germany, assignors to Waggon Union GmbH, Siehe Anlage, Fed. Rep. of Germany

Filed Aug. 4, 1989, Ser. No. 389,777
Claims priority, application Fed. Rep. of Germany, Nov. 26, 1988, 3839994
Int. Cl.[5] B61F *5/14*
U.S. Cl. 105—453 7 Claims



7. A bogie arrangement for rail vehicle with a low-seated

loading ramp of a vehicle body and having a rail vehicle structure gauge, comprising:

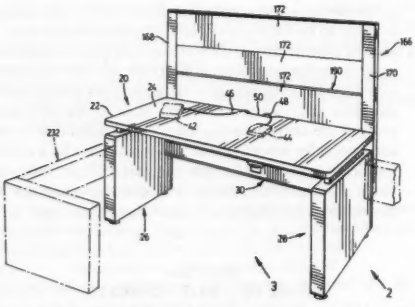
a bogie frame having opposed lateral cheeks and traverse member connecting said opposed lateral cheeks; a plurality of wheel sets, each wheel set including an axle defining a small axle base, said wheel sets being mounted to said bogie frame lateral cheeks via axle journals; spring brackets, one of said spring brackets connected to said lateral cheeks extending outwardly from said lateral cheeks of said bogie frame toward an outer limit of said structure gauge and including a first portion extending horizontally outward from said one of said side cheeks and having a second portion extending obliquely in an upward and outward direction and having a third portion extending vertically in an upward direction; suspension rings connected to said vehicle body; supported leaf springs connected to said spring bracket and having ends extending outwardly from said spring bracket; fixing elements associated with each of said suspension rings, said leaf spring ends each being connected to an associated suspension ring by one of said fixing elements such that said supporting leaf springs are arranged outside of said side cheeks extending laterally between the limit of said structure gauge and a cargo space of said vehicle body and extending above said wheel sets.

5,024,167

DESK SYSTEM

James E. Hayward, Richmond Hill, Canada, assignor to Innovative Metal Inc., Rexdale, Canada

Filed May 12, 1989, Ser. No. 350,812
Int. Cl.[5] A47B *35/00*
U.S. Cl. 108—50 **14 Claims**



1. A desk comprising:

a work top having a work surface;

a structural frame supporting said work top and comprising: at least two spaced parallel gables disposed below respective end portions of said work top each said gable comprising a rigid structural unit including front and rear uprights; work top support means at an upper end of each said unit co-operating with a respective said work top end portion, whereby the work top is supported by said structural units; beam means extending between said gables at an outer edge of said work top and including at least one beam; and disconnectible coupling means between respective ends of said beam and the rigid structural units, said coupling means structurally connecting said beam and units to form said structural frame;

said beam defining at least two wiring channels which extend from end-to-end of the beam and which are electrically screened from one another, said channels being adapted to receive respective wiring sets and permitting access to said sets from a front face of said beam; said gables further including openings permitting communication with ends of said wiring channels from externally of the respective gables;

decorative cladding means comprising at least two cladding panels each overlying an outer face of one of said gables and providing a finished appearance to said gable; and,

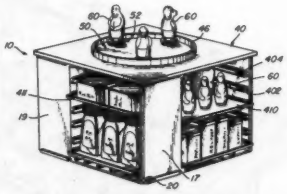
cladding attachment means between inner faces of said cladding panels and said outer faces of the gables, removably attaching said panels to said gables.

5,024,168

CAROUSEL STORAGE DEVICE WITH ROTATING OBJECTS ON TOP THEREOF

David M. Stravitz, 16 Park Ave., New York, N.Y. 10016

Filed Jun. 1, 1990, Ser. No. 532,011
Int. Cl.[5] A47B *57/00*
U.S. Cl. 108—94 **23 Claims**



1. A carousel storage device, comprising:

a multi-sided storage arrangement having a plurality of storage cavities for receiving objects;

rotation means coupled to a lower portion of said multi-sided storage apparatus for permitting rotation of said storage apparatus, said rotation means including a stationary member adapted to be placed on a support surface, and a rotatable member coupled to said stationary member and rotatable relative to said stationary member, said rotatable member being coupled to said multi-sided storage arrangement for rotation therewith;

an upstanding member coupled to said stationary member so as to be immovable relative to said stationary member;

a platform secured to an upper portion of said upstanding member so as to be immovable relative to said upstanding member and relative to said stationary member;

a ring member coupled to either an upper portion of said multi-sided storage apparatus so as to be movable with said multi-sided storage arrangement upon rotation of said multi-sided storage apparatus, or said platform member so as to be stationary upon rotation of said multi-sided storage apparatus, said ring member having a bearing surface; and

at least one rotatable member rotatably coupled to the other of said platform member and said upper portion of said multi-sided storage apparatus, said at least one rotatable member including means for engaging said bearing surface of said ring member for imparting rotation to said at least one rotatable member relative to said platform member upon rotation of said ring member as a result of rotation of said multi-sided storage apparatus.

5,024,169

PROCESS TO REFINE FLYASH CAPTURED FROM PULVERIZED COAL FIRED BOILERS AND AUXILIARY EQUIPMENT

William J. Borowy, Innsbrook Technical Ctr. Virginia Power, 5000 Dominion Blvd., Glen Allen, Va. 23060

Filed Feb. 13, 1990, Ser. No. 479,266
Int. Cl.[5] F23D *1/00*
U.S. Cl. 110—165 A **36 Claims**

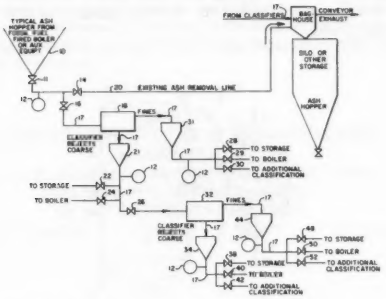
1. A separating and refining process for particulate that has been removed from the exhaust gasses of an organic fuel combustion process which comprises:

determining relative sizes of carbon rich and carbon lean particles that are found in the exhaust gasses of the combustion process;

supplying the particulate matter from the exhaust of the combustion process;

providing a means for conveying said particulate matter between the following steps;

separating, by size, coarse and fine particles in the exhaust particulate so as to yield carbon rich and carbon lean fractions;



separating, by density, any particles from previous separating steps so as to further separate carbon rich and carbon lean fractions;

collecting the carbon rich particles for one of reinjection, storage and subsequent density or size separation;

collecting the carbon lean particles for one of disposal and subsequent density or size separation;

testing samples of carbon lean particles collected during said collecting step for carbon content; and

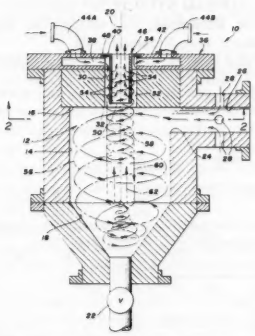
repeating the foregoing separating operations until desired carbon content is achieved so as to allow recycling of flyash.

5,024,170

EXTERNAL COMBUSTOR FOR GAS TURBINE ENGINE

Chandran B. Santanam; William H. Thomas, both of Indianapolis, and Emil R. DeJulio, Columbus, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 31, 1990, Ser. No. 576,026
Int. Cl.[5] F23D *1/02*
U.S. Cl. 110—264 **5 Claims**



1. An external combustor comprising:

a combustor housing with a cyclonic combustion chamber therein defined by a cylindrical side wall aligned on a vertical centerline of said housing and closed on top by a circular end wall and closed on the bottom by a conical wall,

means defining an inlet port through said cylindrical side wall adjacent said circular end wall for discharging into said cyclonic combustion chamber a combustible gas with solids entrained therein at a predetermined velocity generally tangent to said cylindrical side wall whereby a primary spiral swirl of combustion products and entrained solids is established in said cyclonic combustion chamber from said circular end wall toward said conical wall,

said entrained solids being inertially separated from said primary spiral swirl and said conical wall squeezing said primary spiral swirl toward said vertical centerline and reversing the longitudinal flow direction thereof toward said circular end wall,

means defining a cylindrical passage in said combustor housing aligned on said vertical axis and opening into said cyclonic combustion chamber through said circular end wall,

a metal draft sleeve supported on said combustor housing in said cylindrical passage and cooperating therewith in defining an annulus between said cylindrical passage and said draft sleeve opening into said cyclonic combustion chamber through said circular end wall,

said draft sleeve opening into said cyclonic combustion chamber for conducting therefrom a hot gas discharge stream and having an inboard end generally flush with said cylindrical end wall,

means for introducing secondary air into said cyclonic combustion chamber through said annulus at a velocity of between about three and five times said predetermined velocity whereby said secondary air defines a hollow cylindrical extension of said draft sleeve from said inboard end thereof into said cyclonic combustion chamber a distance of between about three and five times said diameter of said draft sleeve, and

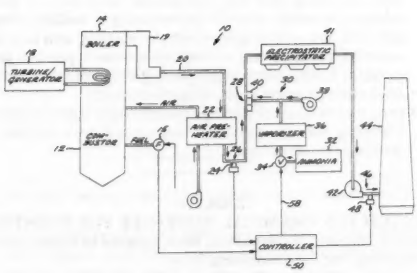
means for diverting a portion of said secondary air from said annulus into said draft sleeve to dilute and cool said hot gas discharge stream therein.

5,024,171

REDUCTION OF ACIDIC EMISSIONS FROM COMBUSTION OF SULFUR-LADEN FUELS

Henry V. Krigmont, Seal Beach; Everett L. Coe, Jr., Downey, and Barry J. Southam, Irvine, all of Calif., assignors to Wahlco, Inc., Santa Ana, Calif.

Filed Mar. 19, 1990, Ser. No. 496,872
Int. Cl.[5] F23J *11/00, 15/00*
U.S. Cl. 110—345 **23 Claims**



1. A method for neutralizing at least a portion of the sulfur trioxide in a gas stream resulting from the combustion of fossil fuels within a boiler, comprising the steps of:

measuring a combustion gas stream at a first location to determine the sulfur trioxide content of the combustion gas stream;

adding ammonia to the combustion gas stream at a second

location downstream of the first location in an amount responsive to the sulfur trioxide content determined in the step of measuring; and

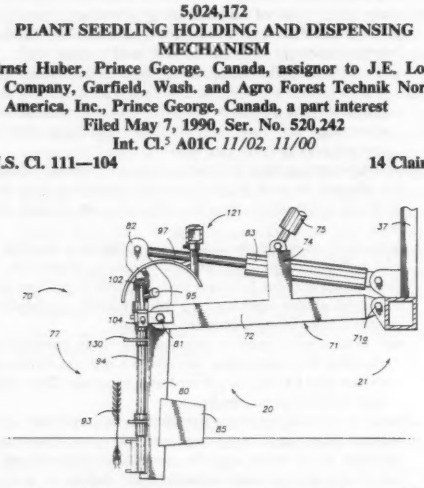
measuring the ammonia content of the gas stream at a third location downstream of the second location.

5,024,172

PLANT SEEDLING HOLDING AND DISPENSING MECHANISM

Ernst Huber, Prince George, Canada, assignor to J.E. Love Company, Garfield, Wash. and Agro Forest Technik North America, Inc., Prince George, Canada, a part interest

Filed May 7, 1990, Ser. No. 520,242
Int. Cl.[5] A01C *11/02, 11/00*
U.S. Cl. 111—104 14 Claims



1. A seedling holder and dispenser for use in a seedling planter to hold a seedling during insertion of the seedling into the soil and to release the seedling when the seedling has been appropriately placed into the soil, comprising:

a planting arm having a distal end mounted for controlled extension into soil and retraction from soil; the planting arm having a leading edge which pierces the soil when the planting arm is extended for planting, and a trailing edge which is opposite to said leading edge;

at least first and second jaws connected to the planting arm in relative juxtaposition; at least one of said first and second jaws being a movable jaw which is movably connected to the planting arm to allow controlled clamping of a seedling between said first and second jaws;

at least one retraction position jaw operator for automatically operating said first and second jaws into an open loading position suitable for loading a seedling therebetween when the planting arm is in a retracted position;

at least one extension position jaw operator for automatically operating said first and second jaws into an open releasing position suitable for releasing a seedling from said first and second jaws when the planting arm is in an extended position; said at least one extension position jaw operator having components thereof different from said at least one retraction position jaw operator;

biasing means connected to bias said movable jaw to achieve clamping between said first and second jaws to hold a seedling therebetween.

5,024,173

CLUTCH FOR CHEMICAL DISPENSER FOR PLANTER

Harry C. Deckler, Williamsburg, Iowa, assignor to Kinze Manufacturing, Inc., Williamsburg, Iowa

Filed Jan. 29, 1990, Ser. No. 471,504
Int. Cl.[5] A01C *7/20;* G01F *11/10;* F16D *13/50*
U.S. Cl. 111—178 9 Claims

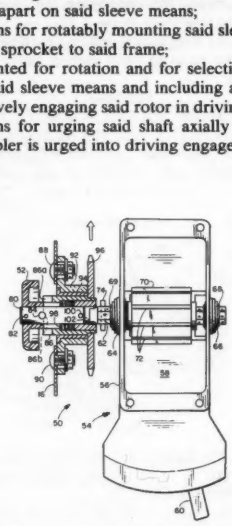
1. In an agricultural planter row unit having a frame, a hopper mounted to said frame for storing chemicals, a meter for metering said chemicals from said hopper for distribution and including a rotor, and drive means including a drive sprocket adapted to drive said rotor, an improved clutch for selectively coupling said drive sprocket to said rotor or uncoupling said drive sprocket from said rotor comprising:

sleeve means mounted to said drive sprocket for rotation therewith and axially aligned with said rotor, said sleeve means including a drive recess and a retainer recess spaced angularly apart on said sleeve means;

bearing means for rotatably mounting said sleeve means and said drive sprocket to said frame;

a shaft mounted for rotation and for selective axial movement in said sleeve means and including a drive coupler for selectively engaging said rotor in driving engagement;

biasing means for urging said shaft axially such that said drive coupler is urged into driving engagement with said rotor; and



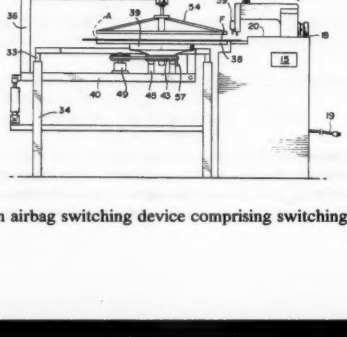
a grip member mounted to said shaft, said shaft including drive pin means adapted to be received in one of said recesses, said drive and retainer recesses being spaced at different distances from said rotor and a cam surface extending between one end of said drive recess and the adjacent end of said retainer recess, said cam surface being arranged such that when said grip member is rotated in one direction, said drive pin rides along said cam surface from said drive recess to said retainer recess against the force of said biasing means, thereby moving said shaft axially and disengaging said coupler from said rotor, and when said grip member is rotated in a counter direction, said drive pin rides along said cam surface from said retainer recess to said drive recess and said biasing means moves said shaft axially to cause said coupler to engage said rotor.

5,024,174

AIRBAG STITCHING DEVICE

Vivian Ferguson, Richmond, Va., assignor to Automated Machinery Systems, Inc., Richmond, Va.

Filed Sep. 29, 1989, Ser. No. 414,404
Int. Cl.[5] D05B *3/00, 27/10*
U.S. Cl. 112—121.24 9 Claims



1. An airbag switching device comprising switching means

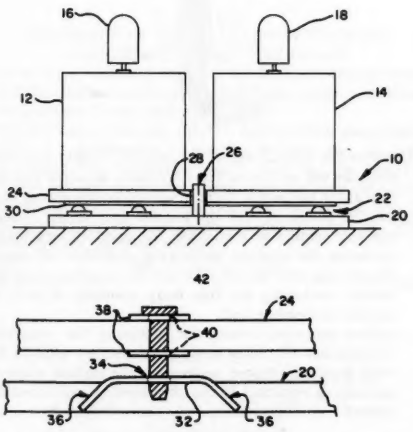
for stitching along a sewing plane and a rotatable support member for rotation about an axis disposed on a horizontal plane adjacent to said stitching means and adapted to receive a pair of superimposed circular cloth layers having outer edges thereon, clamp means for holding the superimposed circular layers of cloth on said rotatable support member, and positioning means for tilting said support member, said clamp means and circular cloth layers on an incline with respect to the sewing plane, means for activating said stitching means and means for rotating said support member, clamping means and cloth in a tilted position to thereby feed a peripheral portion of the superimposed circular layers of cloth into the stitching means so that the outer edges of the cloth are sewn together, and means for terminating rotation of the support member and cloth and for deactivation of the stitching means after completing 360° of rotation.

5,024,175

FLEXIBILITY ENHANCEMENT MULTI-MACHINE CAROUSEL

William E. Epstein, Rte. 4, Box 152, Anderson, S.C. 29624

Filed Nov. 15, 1989, Ser. No. 436,707
Int. Cl.[5] D05B *75/00*; A47B *29/00*
U.S. Cl. 112—217.2 **19 Claims**



1. A multi-machine carousel assembly for supporting at least two machines and selectively positioning each machine for use at a work station comprising:

a base having an upper surface and a lower surface, the lower surface being supported by a ground surface;

a platform having an upper surface and a lower surface; pivot means for mounting the platform to the base and allowing rotating of the platform about an axis in common with the base;

bearing means for supporting the platform mounted upon the upper surface of the base and engaging the lower surface of the platform;

the platform supporting said at least two machines so that an operator can rotate the platform to selectively position one of said at least two machines in a position adjacent the operator;

at least one receiving member connected to the base including a retaining member having at least one inclined ramp located at an end of the retaining member, the retaining member having an aperture therethrough and being connected to the base; and

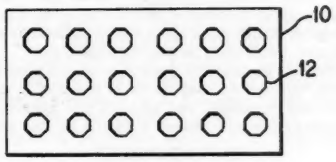
at least one extending member connected to the platform for selectively interlocking with the receiving member to prevent rotation of the platform; the inclined ramp operably serving to push and guide the extending means toward the aperture of the retaining member.

5,024,176

NEEDLEPOINT SHEET HAVING OCTAGONAL OPENINGS AND METHOD OF USE THEREOF

Louis P. Musante, Fairview, Pa., assignor to Louis P. Musante, Fairview, Pa. and Lynda S. Musante, Fairview, Pa.

Filed Jan. 16, 1990, Ser. No. 465,367
Int. Cl.[5] D03D *29/00*
U.S. Cl. 112—266.1 **18 Claims**



1. A needlepoint sheet of flexible plastic material, comprising:

a sheet of flexible plastic material having a plurality of channels therethrough for receiving thread-like material,

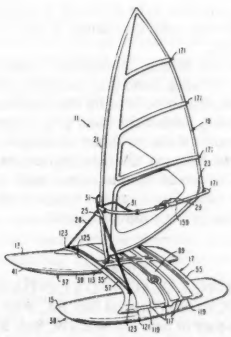
each of said channels being enclosed by a channel wall having eight sides.

5,024,177

WIND SAILING SURF VESSEL WITH DUAL PLANAR SURFACES

Steven D. Winter, 47 Ilex Dr., Newbury Park, Calif. 91320; Michael J. Botich, 1307 Hanover Ct., Ventura, Calif. 93003, and Eric Adickes, 315 Anacapa View Dr., Malibu, Calif. 90265

Filed Apr. 26, 1989, Ser. No. 328,163
Int. Cl.[5] B63B *1/00*
U.S. Cl. 114—61 **13 Claims**



1. A wind sailing vessel for sailing over a water surface comprising:

(a) a first elongated board defining an undersurface substantially planar, said first elongated board being buoyant in water;

(b) a second elongated board defining an undersurface substantially planar, said second elongated board being buoyant in water;

(c) platform means for joining said first and second elongated boards in parallel relationship, wherein said platform means is dissociable from each of said elongated boards and each of said elongated boards having slots for

receiving a centerboard means, wherein said platform means defines a slot parallel to said elongated boards in an assembled condition and sized to allow a portion of said centerboard means to extend therethrough, whereby said centerboard means can be retracted or extended through said slot and retained therein during sailing, and wherein said platform means comprising independent sections which can be selectively dissociated from each other, wherein said platform means can be collapsed for ease of transportation or storage;

(d) centerboard means for providing sailing maneuverability operatively associated with said platform means, wherein said centerboard means is parallel to said elongated boards and provides substantial steerability yet remains fixed and rigid while sailing, wherein said planar undersurfaces of said elongated boards skim over the water surface and said elongated boards pivot about a point defined by said centerboard means upon turning the vessel; and

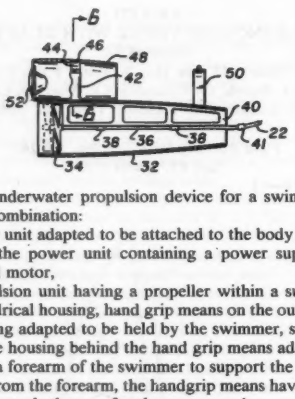
(e) sail means for catching gusts of wind and propelling the vessel, wherein said sail means is pivotally mounted on said platform means, and wherein said platform means provides a centrally located mounting for said sail means.

5,024,178

UNDERWATER PROPULSION DEVICE

Martin G. Bruce, Box 20011, #4-9764-5th St., Sidney, B.C., Canada V8L 5C9

Filed Feb. 14, 1990, Ser. No. 479,884
Int. Cl.[5] B63C *11/46*
U.S. Cl. 114—315 **10 Claims**



1. An underwater propulsion device for a swimmer comprises in combination:

a power unit adapted to be attached to the body of a swimmer, the power unit containing a power supply and a sealed motor,

a propulsion unit having a propeller within a substantially cylindrical housing, hand grip means on the outside of the housing adapted to be held by the swimmer, strap means on the housing behind the hand grip means adapted to fit over a forearm of the swimmer to support the propulsion unit from the forearm, the handgrip means having operating controls thereon for the motor, and

flexible drive extending from the motor in the power unit to the propeller in the propulsion unit.

5,024,179

FOLDABLE SIGNAL FLAG AND STANDARD ASSEMBLY

Harold P. Leffel, E. 1245 Crystal Bay Rd., Post Falls, Id. 83854

Continuation-in-part of Ser. No. 402,829, Sep. 5, 1989, Pat. No. 4,962,720. This application Sep. 19, 1990, Ser. No. 585,301
Int. Cl.[5] G09F *17/00*
U.S. Cl. 116—173 **18 Claims**

9. A self storing signal flag assembly for subsurface mounting to a support, comprising:

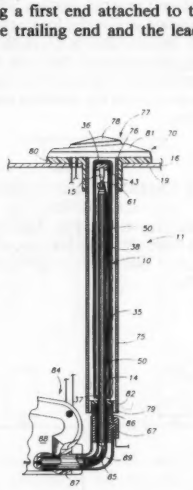
a retractable standard having telescoping standard sections extendable to an operative exposed elongated condition and retractable to a shortened storage condition and including a top section extending to a top end and an adjacent section slidably receiving the top section therein, the adjacent section including a top shoulder through which the top section extends;

a tubular connector member including a top end and a bottom end loosely receivable over at least a portion of the top section of the standard to enable at least a portion of the standard to be retracted into the connector member between the top and bottom edges thereof;

a fitting on the connector member for securing the connector member to the retractable standard;

a flag body formed of a flexible material and including a leading edge securable to the connector member, and a free trailing end;

a lanyard having a first end attached to the flag body between the free trailing end and the leading edge, and a second end;



a clip on the second end of the lanyard, loosely receivable over the top section of the retractable standard and slidable along the length thereof within the connector member, for abutment with the top shoulder of the adjacent standard section so that when the standard sections are retracted, the adjacent section top shoulder will engage the clip and pull the lanyard into the connector member, thereby gathering the flag body inwardly toward the connector member; and

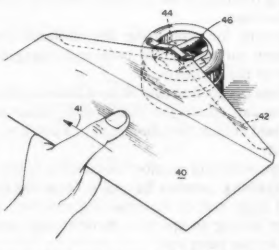
a surface mounting means for mounting the retractable standard and flag body to a support surface with the flag body standard situated underneath the surface when the standard is retracted to the shortened storage condition thereof.

5,024,180

STAMP AND ENVELOPE MOISTENER

Lorand J. Roman, 2734 Tech Ave., San Angelo, Tex. 76904

Filed Mar. 5, 1990, Ser. No. 488,936
Int. Cl.[5] B05C *1/02, 1/08*
U.S. Cl. 118—244 **9 Claims**



1. A moistener for dried glue, said moistener comprising:

a cup,

a reservoir defined by the cup,

a shaft mounted in the cup and extending across the reservoir,

a roller rotatably mounted on the shaft, said roller having a longitudinal axis,

said roller including a knurled peripheral surface having raised diamond shaped projections formed by intersecting grooves,

one set of parallel grooves being spaced approximately 1/32 inch apart and a second set of parallel grooves being spaced approximately 1/32 inch apart and extending transverse to said one set of grooves to form the intersecting grooves,

said projections including two opposing corners defining an angle of 60° and two opposing corners defining an angle of 120°,

said one set of grooves intersecting at an angle of 60° with respect to said second set of grooves and said one set and said second set intersecting the longitudinal axis of said roller at an angle of 30° and forming a plurality of pockets, said pockets formed by said one set and said second set of grooves being located between the projections so that a uniform film of water is formed across and above a peripheral surface of the roller during rotation of the roller through water held in the reservoir and applied directly to the dried glue of an article to be moistened.

5,024,181

METHOD FOR THE DEVELOPMENT OF AN ELECTROSTATIC LATENT IMAGE

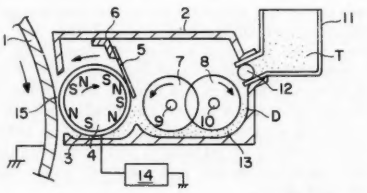
Hisashi Shoji; Akihiko Tamura; Masahiko Itaya; Hiroshi Fuma, and Shinobu Soma, all of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Continuation of Ser. No. 228,772, Aug. 4, 1988, abandoned, which is a continuation of Ser. No. 900,399, Sep. 26, 1986, abandoned. This application May 7, 1990, Ser. No. 520,117

Claims priority, application Japan, Aug. 30, 1985, 60-192711; Aug. 30, 1985, 60-192713; Sep. 19, 1985, 60-208046; Jan. 24, 1986, 61-14537; Jan. 24, 1986, 61-14538; Jan. 24, 1986, 61-14539; Mar. 24, 1986, 61-66632

Int. Cl.[5] G03G *15/09*

U.S. Cl. 118—658 **26 Claims**



3. A method of developing an electrostatic latent image on a rotatable image surface of an image carrying member, said method comprising;

supplying a developer containing a magnetic carrier and a toner to a developer transporting means, said transporting means including a rotatable cylindrical sleeve member and a magnetic member provided inside said sleeve member whereby the developer is attracted to and forms a developer layer on said sleeve member, said sleeve member facing said image surface with a distance therebetween so as to form a developing zone,

regulating the amount of developer to be transported to the developing zone by a developer-regulating means so that the amount of toner on said sleeve member [mt] in mg/cm^2, the peripheral speed of said image surface [Vd] and the peripheral speed of said sleeve member [Vsl] satisfying the following relation:

$$|Vsl/Vd| \times mt \geqq 0.4 \ (mg/cm^2)$$

$$|Vsl/Vd| \leqq 10$$

said developer regulating means bearing against said developer layer whereby the thickness of said developer layer is less than said distance,

bringing the developer into close proximity to the electrostatic latent image formed on said image surface, and adhering the toner to a low potential portion of said electrostatic latent image.

5,024,182

THIN FILM FORMING APPARATUS HAVING A GAS FLOW SETTLING DEVICE

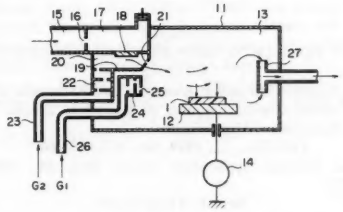
Toshiyuki Kobayashi; Masao Koshinaka; Yoshimi Kinoshita; Masao Oda, and Kenji Yoshizawa, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jul. 6, 1989, Ser. No. 376,015

Claims priority, application Japan, Jul. 15, 1988, 63-175231

Int. Cl.[5] C23C *16/50*

U.S. Cl. 118—723 **11 Claims**



1. An apparatus for forming a thin film on a substrate by reacting first and second gases comprising:

a vessel enclosing a reaction chamber;

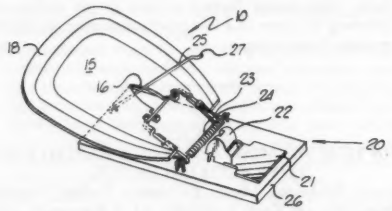
substrate holding means for holding a substrate in said reaction chamber;

plasma generating means including a waveguide for transmitting microwave energy toward said reaction chamber, said waveguide including two substantially planar, generally parallel, electrically conducting walls that are elongated in a first direction transverse to the direction of propagation of microwaves in said waveguide, and an elongated dielectric window generally parallel to and extending in one of said walls in the first direction for transmitting microwave energy from the waveguide to a first gas inlet means;

first gas inlet means disposed between said plasma generating means and said reaction chamber including a plasma chamber extending in the first direction for receiving microwave energy transmitted through the dielectric window to establish and maintain a plasma in the first gas in said plasma chamber, a first gas inlet for supplying the first gas to said plasma chamber, first flow settling means disposed between said first gas inlet and said plasma chamber for settling flow of the first gas into the plasma chamber including plates disposed transverse to the flow of the first gas for establishing a tortuous flow path for the first gas, and including an elongated opening extending in the first direction for flow of the first gas from said plasma chamber into said reaction chamber; and

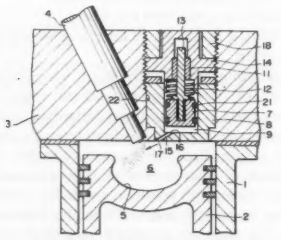
second gas inlet means including an outlet extending in the first direction in communication with said reaction chamber for supplying the second gas to said reaction chamber, said outlet being disposed proximate the opening of said first gas inlet means.

5,024,183
ANIMAL TRAINING DEVICE
William G. Baer, 4500 Homestead, Littleton, Colo. 80123
Filed Apr. 24, 1990, Ser. No. 513,615
Int. Cl.[5] A01K *29/00*
U.S. Cl. 119—29 17 Claims



1. An animal training device comprising a generally thin, generally planar flapper portion having a generally broad face, a spring means for tensioning said flapper portion in a first tensioned position, a release means for releasing said spring means and for releasing said flapper portion from said tensioned position and causing said flapper portion to move in a path to a second released position.

5,024,184
DIRECT FUEL INJECTION INTERNAL COMBUSTION ENGINE
Susumu Nagano; Hiromitsu Kawazoe, and Katsuyuki Ohsawa, all of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan
Filed Dec. 22, 1989, Ser. No. 455,160
Claims priority, application Japan, Dec. 26, 1988, 63-168558[U]
Int. Cl.[5] F02B *75/04*
U.S. Cl. 123—48 R 12 Claims



1. A direct fuel injection internal combustion engine, comprising:

a combustion chamber formed by a cylinder, a cylinder head opposed to said cylinder, and a piston slidably inserted in said cylinder;

a piston cavity provided in said combustion chamber;

a fuel injector secured in said cylinder head and adapted to inject and supply fuel into said piston cavity;

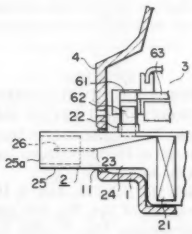
an air chamber defined by an auxiliary cylinder formed in said cylinder head in proximity to said piston cavity and by an auxiliary piston inserted in said auxiliary cylinder, the maximum volume of said air chamber being about 0.1% to about 1.0% of the cylinder stroke volume;

a communicating passage which allows said air chamber and said combustion chamber to communicate with each other and is oriented toward said piston cavity; and

a spring which is adapted to urge said auxiliary piston in a direction of reducing the volume of said air chamber and which, during a pressure rise of said combustion chamber, is adapted to increase said volume of said air chamber and move said auxiliary piston in the direction of modulating a sharp pressure rise of said combustion chamber, and which, during a pressure drop of said combustion chamber, is adapted to decrease said volume of said air chamber and move said auxiliary piston in a direction of jetting air through said communicating passage;

whereby said sharp pressure rise of said combustion chamber is modulated, and a turbulence is imparted to the combustion gas in said combustion chamber during a diffusive combustion.

5,024,185
IGNITION DISTRIBUTOR OF INTERNAL COMBUSTION ENGINE
Yoshikuni Fujita, and Haruyuki Matsuo, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 15, 1990, Ser. No. 493,668
Claims priority, application Japan, Mar. 16, 1989, 1-29151; Mar. 16, 1989, 1-29152
Int. Cl.[5] F02P *7/02*
U.S. Cl. 123—146.5 A 11 Claims



1. An ignition distributor for an internal combustion engine, comprising:

a housing surrounding a shaft synchronously rotatable with a crankshaft of said engine, said housing containing at least one electrical device including terminals for an ignition coil, an igniter, and a rotational angle detector;

means defining a through hole in said housing for electrically connecting said electrical device therethrough to the outside of said housing; and

leading means including at least one connecting section connected electrically to said electrical device, a connector section arranged in said through hole defined in said housing, a lead wire section electrically connecting said connecting section and said connector section, and a mold section defining a rigid integral part by molding together said connecting section, said connector section and said lead wire section.

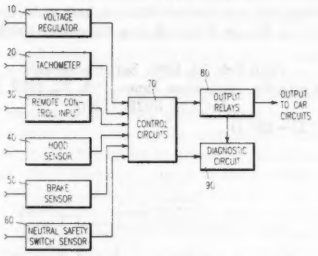
5,024,186
REMOTE AUTOMOBILE STARTER
Robert Long, New Carrolton, Md., and Mark Gottlieb, Annandale, Va., assignors to Design Tech International, Inc., Springfield, Va.
Filed Dec. 11, 1989, Ser. No. 448,289
Int. Cl.[5] F02N *11/08*
U.S. Cl. 123—179 B 12 Claims

1. An automobile installation diagnostic test system comprising:

an add-on remote automobile starter said remote starter being connected to a starter motor of said automobile, and to to a plurality of pre-existing automobile electrical sensing circuits which electrically sense respective predetermined conditions of said automobile;

an indicating means for receiving a signal from each of said

pre-existing automobile and electrical sensing circuits for indicating that each of said predetermined conditions is



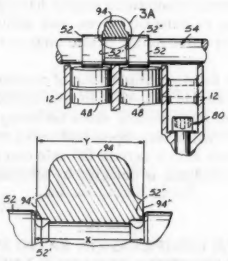
being sensed, thereby ensuring that said remote starter is installed correctly.

5,024,187

SYSTEM FOR AXIALLY LOCATING A CAMSHAFT

Emile A. M. Bakker, Windsor, Netherlands, assignor to Chrysler Corporation, Highland Park, Mich.

Filed Aug. 14, 1990, Ser. No. 566,921
Int. Cl.[5] F02F *1/00*; F01L *1/00*
U.S. Cl. 123—193 H **5 Claims**



1. In an internal combustion engine of the type having a cylinder head assembly with at least one rotatable camshaft mounted thereon, an improved camshaft retention arrangement, comprising: a pair of cam lobes closely spaced in the axial direction of the camshaft; each lobe having an end thrust surface extending in a plane normal to the camshaft axis, the end thrust surfaces facing one another and being spaced axially apart a precise dimension to define an axially extending gap; a bearing retainer cap attached to the cylinder head and occupying the gap formed between the end thrust surfaces, the retainer cap having a pair of side surfaces defining a width dimension therebetween, the retainer cap width being just sufficient to fill the gap whereby engagement of abutting end and side surfaces of the lobes and retainer respectively prevents axial movement of the camshaft with respect to the bearing cap and the cylinder head.

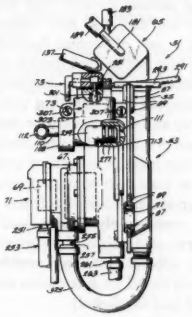
5,024,188

FUEL SUPPLY SYSTEM COMPONENT ASSEMBLY

David J. Hartke, and Kathleen A. Appelt, both of Gurnee, Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Mar. 2, 1990, Ser. No. 487,669
Int. Cl.[5] F02F *7/00*
U.S. Cl. 123—195 A **8 Claims**

1. An engine comprising a crankcase cover, a bracket, a fuel supply component mounted on said bracket and comprising one of a fuel pump, an oil pump, a combined fuel and oil pump, a fuel vapor separator, a fuel vapor pump, a fuel filter, a primer



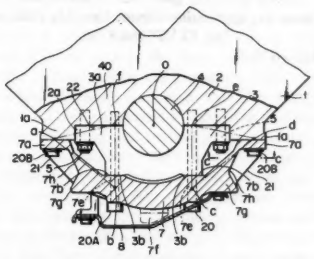
fuel control valve, and a vacuum switch, and means mounting said bracket on said cover.

5,024,189

ENGINE UNIT

Sadakatsu Ushio, Otsu; Noboru Nakamura, Kyoto; Hirofumi Higashi, Kameoka; Masataka Iwata, Handa, and Fumiyasu Niwa, Nagoya, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 29, 1990, Ser. No. 471,945
Claims priority, application Japan, Jan. 31, 1989, 1-10701[U]
Int. Cl.[5] F02F *7/00*
U.S. Cl. 123—195 R **9 Claims**



1. An engine unit in which a crankshaft is rotably arranged, comprising:

a cylinder block including a pair of side walls extending parallel to said crankshaft, with said crankshaft between said side walls, a pair of first flanges formed on lower edges of the side walls, a plurality of first partition walls arranged between said side walls and connecting said first flanges to each other, and a plurality of crank journals formed on lower edges of said first partition walls and each receiving said rotatable crankshaft;

a lower case fixed to said cylinder block and covering said crankshaft, said lower case including a substantially semi-cylindrical bottom wall located outside of a locus of rotation of said crankshaft and having a pair of side edges extending in parallel to the axis of the crankshaft, a pair of second flanges formed on said side edges of the bottom wall and abutting against said first flanges, and a plurality of second partition walls formed on said bottom wall and opposing and associtated with said first partition walls, respectively;

a plurality of bearing caps holding said rotatable crankshaft in cooperation with said crank journals, each of said bearing caps clamped between said associated first partition wall and second partition wall; and

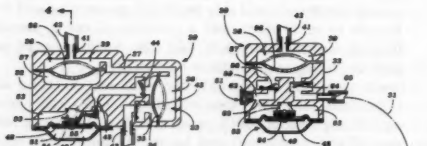
a plurality of fixing means for fixing said lower case to said cylinder block, each of said fixing means having a pair of first fastening members fastening said associated first partition wall and second partition wall and said bearing cap clamped between the first and second partition walls together, and a pair of second fastening members each fastening said first and second flanges to each other, each of said first fastening members extending from under the lower case into said first partition wall, passing through said bearing cap and second partition wall, said pair of first fastening members being located between said pair of second fastening members, each of said second partition walls having at least two contact portions which contact the bearing cap and through which said pair of first fastening members respectively extend, said crankshaft being located between said pair of first fastening members, and said first and second fastening member of each fixing means being arranged on a common plane perpendicular to said axis of said crankshaft.

5,024,190

OIL SUPPLY DEVICE FOR TWO CYCLE ENGINE

Takuma Kameyama, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Dec. 11, 1989, Ser. No. 448,704
Claims priority, application Japan, Dec. 12, 1988, 63-311865
Int. Cl.[5] F01M *1/00*
U.S. Cl. 123—196 R **13 Claims**



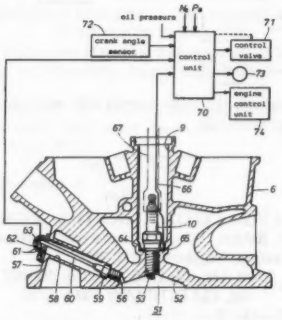
1. A lubricating system for an internal combustion engine comprising a lubricant pump for pumping lubricant, conduit means for conveying lubricant to the engine from said lubricant pump, and means for mixing a controlled amount of another fluid with said lubricant prior to delivery to said pump for pumping small amounts of lubricant.

5,024,191

CONTROL SYSTEM FOR A VARIABLE VALVE ACTUATING MECHANISM OF AN INTERNAL COMBUSTION ENGINE

Kenichi Nagahiro, and Takashi Moriya, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 22, 1990, Ser. No. 483,255
Claims priority, application Japan, Feb. 22, 1989, 1-42268
Int. Cl.[5] F02B *77/00*
U.S. Cl. 123—198 D **6 Claims**



1. A control system for a variable valve actuating mechanism for an internal combustion engine having a camshaft for actuating intake or exhaust valves, and adjusting means for changing a lift or valve timing of said intake or exhaust valves, comprising:

sensor means for detecting a state of combustion in a cylinder of said engine so as to indirectly monitor an operating condition of said variable valve actuating mechanism;

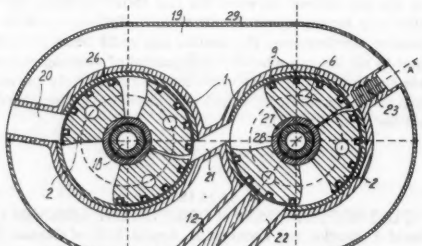
a control unit which acts upon said valve actuating mechanism to force it to a certain fail safe condition when any abnormal condition is detected by said sensor means.

5,024,192

VARIABLE COMPRESSION RATIO INTERNAL COMBUSTION ROTATING ENGINE

Eliodoro Pomar, Apartado de Correos 366, Torremolinos, Malaga, Spain

Continuation-in-part of Ser. No. 57,006, Jun. 1, 1987, abandoned. This application Apr. 3, 1989, Ser. No. 333,095
Claims priority, application Italy, Jun. 6, 1986, 20701 A/86
Int. Cl.[5] F02B *53/08*
U.S. Cl. 123—245 **4 Claims**



1. A variable compression ratio internal combustion engine comprising first and second separated adjoining cylinders and first and second pluralities of pistons rotatably housed in each said first and second cylinders, said first and second cylinders

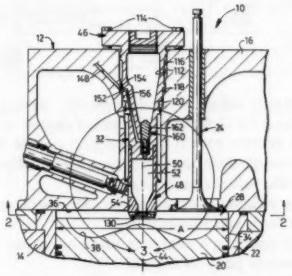
defining a plurality of variable volume chambers defined by a portion of inner walls of said first and second cylinders and by side walls of said pistons, said pistons having a substantially circular sector shape cross-section, each said piston rotating within each said cylinder with an uneven circular motion, a mechanism for rotating each said piston, said mechanism including a crank having a plurality of arms and an eccentric axis with respect to the axis of each said cylinder, and coupling rods between the arms of the crank and end portions of shaft members passing through said pistons, there being moreover provided means for changing the compression ratio of said engine, said means operating by changing the eccentricity of the axis of said crank with respect to the cylinder axis, said plurality of chambers comprising a first series of chambers associated with said first cylinder and a second series of chambers associated with said second cylinder, said first cylinder having intake port means for supplying an air-fuel mixture to said first series of chambers for compressing by said first plurality of pistons in said first series of chambers said air-fuel mixture, and transfer port means communicating said first cylinder with said second cylinder, said second cylinder having exhaust port means and scavenging port means for carrying out by said second plurality of pistons in said second series of chambers a further compression of said air-fuel mixture, a combustion thereof and an exhaust and scavenging of burnt gases from said second series of chambers.

5,024,193

FUEL COMBUSTION SYSTEM, METHOD, AND NOZZLE MEMBER THEREFOR

Russell R. Graze, Jr., Dunlap, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Feb. 6, 1990, Ser. No. 475,517
Int. Cl.[5] F02B *19/18*
U.S. Cl. 123—259 **68 Claims**



1. In a fuel combustion system for a gas engine defining a main combustion chamber above a reciprocating piston and a precombustion chamber assembly in communication therewith, defining a prechamber, and igniting means for igniting a mixture of gaseous combustible fuel and air in the prechamber and forming expanding burning gases, wherein the improvement comprises:

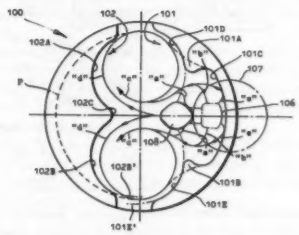
ejection passage means defining by the precombustion chamber assembly, the ejection passage means includes a plurality of ejection passages of a preselected geometric cross-section in communication with the prechamber for directing and controllably expanding the burning gases from the prechamber into the main combustion chamber at a velocity greater than the speed of sound.

5,024,194

FLAME DISPERSION ARRANGEMENT FOR SWIRL CHAMBER TYPE DIESEL ENGINE PISTON CROWN

Motohiro Shinzawa, Yokosuka, and Yoshiki Sekiya, Yokohama, both of Japan, assignors to Nissan Motor Company, Ltd., Yokohama, Japan

Filed Jul. 6, 1990, Ser. No. 549,033
Claims priority, application Japan, Jul. 10, 1989, 1-177766; Jul. 10, 1989, 1-177767
Int. Cl.[5] F02F *3/24*
U.S. Cl. 123—269 **7 Claims**



1. In an internal combustion engine

a piston reciprocatively disposed in a bore to define a variable volume combustion chamber;

a swirl chamber, said swirl chamber being fluidly communicated with the combustion chamber by a transfer port, said piston comprising:

an essentially flat crown;

a shaped cavity formed in said crown, said cavity being in part bounded by first and second opposed walls;

an island-like flame deflecting projection, said island-like flame deflecting projection comprising a member which projects up from the floor of said cavity and which is arranged in the path of the flame which ejects from said transfer passage during the expansion phase of the engine and when the piston is close to its TDC position;

said first wall being arranged to have first and second guide portions, said first and second guide portions extending inwardly toward one of the center of the piston crown or the island-like flame deflecting projection, said first wall further comprising a first curved section which merges with said first and second guide portions, said first and second guide portions and said curved portion defining in part a first flame dispersion zone in said cavity, said first curved wall portion being so constructed and arranged as to deflect a portion of the flame which flows theretoward and which promotes mixing of the flame with the air contained in said first flame dispersing zone;

second and third concavely curved wall portions formed in said first wall, said second and third wall portions being formed in said first wall at locations outboard of said first and second guide portions, respectively;

fourth and fifth concavely curved wall portions formed in said second wall, said fourth and fifth wall portions cooperating to define a nose portion which projects into said cavity, said nose portion being arranged in the path of the flame which ejects from said transfer passage after said piston descends from its TDC position by a predetermined amount, said fourth and fifth wall portions further cooperating with said second and third curved wall portions of said first wall in a manner to define second and third essentially circular flame dispersing zones in which spiralling flows are established; and

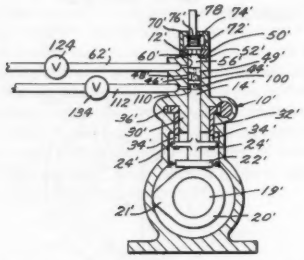
means embodied in the construction of said shaped cavity for modifying the spiralling characteristics of the spiralling flows in said second and third flame dispersing zones in a manner which improves combustion characteristics.

5,024,195

MULTI-FUEL COMPRESSION-IGNITION ENGINE AND FUEL INJECTION PUMP THEREFOR

Pao C. Pien, 1105 Marbelle Club, 840 S. Collier Boulevard, Marco Island, Fla. 33937

Filed Jun. 7, 1990, Ser. No. 536,016
Int. Cl.[5] F02D 19/08
U.S. Cl. 123—304 22 Claims



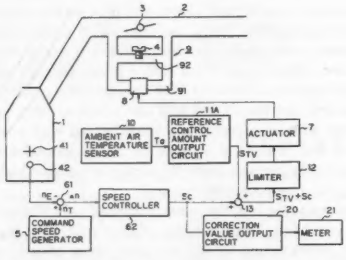
1. A multi-fuel compression-ignition internal combustion engine comprising a first source of primary fuel, a second source of secondary fuel, injection pump means including a body means having a bore therein, plunger means movably mounted within said bore, said plunger means having an end portion defining with a portion of said bore a mixing chamber, first supply means for supplying primary fuel from said first source to said mixing chamber, second supply means for supplying secondary fuel from said second source to said mixing chamber so that said primary and secondary fuels are mixed in said mixing chamber to provide a mixture of the primary and secondary fuels, said second supply means including means spaced from said end portion in a direction away from said mixing chamber for providing a seal between said bore and said plunger means to prevent leakage of primary fuel past the seal, valve means permitting flow of fuel from said mixing chamber but substantially preventing flow of fuel back into said mixing chamber, a cylinder having a piston reciprocably mounted therein and defining with said cylinder a combustion chamber, fuel injection means for injecting fuel into said combustion chamber, and means connecting said fuel injection means with said valve means so that said fuel injection pump means provides fuel under high pressure to said fuel injection means.

5,024,196

IDLE SPEED ADJUSTING SYSTEM FOR INTERNAL COMBUSTION ENGINE

Hirofumi Ohuchi, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 8, 1990, Ser. No. 610,664
Claims priority, application Japan, Nov. 9, 1989, 1-293213
Int. Cl.[5] F02D 41/16
U.S. Cl. 123—339 3 Claims



1. An idle speed adjusting system for effecting feedback control of the idle speed of an internal combustion engine, comprising:

reference control amount output circuit means for producing and delivering a reference control signal necessary for maintaining a command engine speed;

speed control means for generating a speed correction signal representing the offset of the running speed of said engine from said command engine speed;

flow rate control means for controlling the flow rate of intake air supplied to said engine, in accordance with said reference control signal and said speed correction signal;

auxiliary flow rate control means for controlling the flow rate of the intake air in accordance with said speed correction signal and independently of said flow rate control means, so as to adjust said speed correction signal to a predetermined value; and

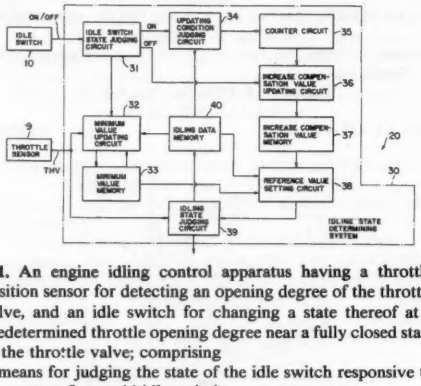
ambient air temperature sensing means for delivering an ambient air temperature signal to said reference control amount output circuit means so as to vary said reference control signal in accordance with a change in the ambient air temperature.

5,024,197

ENGINE IDLING CONTROL APPARATUS

Akihisa Nakamura, Tokyo, Japan, assignor to Fuji Jukogyo Kabshiki Kaisha, Tokyo, Japan

Filed Apr. 26, 1990, Ser. No. 515,084
Claims priority, application Japan, Apr. 28, 1989, 1-110563; Apr. 28, 1989, 1-110564
Int. Cl.[5] F02D 41/08, 41/16
U.S. Cl. 123—339 4 Claims



1. An engine idling control apparatus having a throttle position sensor for detecting an opening degree of the throttle valve, and an idle switch for changing a state thereof at a predetermined throttle opening degree near a fully closed state of the throttle valve; comprising

means for judging the state of the idle switch responsive to output from said idle switch;

means for updating a minimum value of output values from said throttle position sensor;

means for updating an increase compensation value to increase when said idle switch state judging means judges closed state of said idle switch, and for updating said increase compensation value to initialize when said idle switch state judging means judges open state of said idle switch;

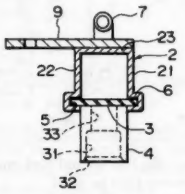
means for setting a references value to judge an idling state by adding said increase compensation value from said increase compensation value updating means and a predetermined offset value to said minimum value from said minimum value updating means; and

means for judging said idling state by comparing said reference value which is set by said reference value setting means with said output value from said throttle position sensor.

5,024,198
FUEL DELIVERY RAIL ASSEMBLY

Masayoshi Usui, Numazu, Japan, assignor to Usui Kokusai Sangyo Kaisha Ltd., Shizuoka, Japan

Filed Jun. 1, 1990, Ser. No. 531,684
Claims priority, application Japan, Jun. 6, 1989, 1-65436[U]
Int. Cl.[5] F02M *55/02*
U.S. Cl. 123—468 2 Claims



1. A fuel delivery rail assembly for an internal combustion engine comprising;

an elongated conduit having a fuel inlet at an end and a fuel exit at the other end, and

a plurality of sockets so formed as to receive fuel injectors,

the section of said conduit being formed in a hollow shape having four walls, one of said walls being made from aluminum die casting, and the other walls being integrally formed by steel materials,

opposing edges of said steel walls being provided with cavities for receiving respective edges of said aluminum wall,

abutment portions between said aluminum wall and said steel walls being mechanically shrinked from outside thereby being tightly combined,

each of said sockets being integrally formed with said aluminum wall.

5,024,199
AIR-FUEL RATIO CONTROL SYSTEM FOR AUTOMOTIVE ENGINE

Kunihiro Abe, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 29, 1989, Ser. No. 414,451
Claims priority, application Japan, Oct. 7, 1988, 63-25359
Int. Cl.[5] F02M *51/00;* F02D *41/14*
U.S. Cl. 123—489 13 Claims

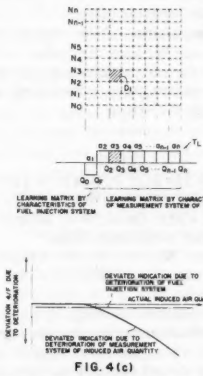

LEARNING MATRIX BY CHARACTERISTICS OF FUEL INJECTION SYSTEM
LEARNING MATRIX BY CHARACTERISTICS OF MEASUREMENT SYSTEM OF INDUCED AIR
DEVIATED INDICATION DUE TO DETERIORATION OF FUEL INJECTION SYSTEM
ACTUAL INDUCED AIR QUANTITY Q
DEVIATED INDICATION DUE TO DETERIORATION OF MEASUREMENT SYSTEM OF INDUCED AIR QUANTITY

FIG. 4(c)

1. An air-fuel ratio control system for an automotive engine, having a crank angle sensor for detecting an engine speed, an exhaust gas sensor for detecting an actual air-fuel ratio, a fuel injection system with an injector for injecting an air-fuel mixture into a combustion chamber of said engine, and an intake air quantity measurement system including an intake air quantity sensor for measuring an intake air quantity;

the control system comprising

means for setting a learning region by characteristics change of said fuel injection system and said air measurement system corresponding to an operational region;

learning means for representatively learning a correction quantity of said fuel injection system at a specified point of said operational region, and for learning a correction quantity of said air measurement system in other points of said operational region in dependency on an instruction from said means for setting a learning region on the basis of the difference between a reference value of an air-fuel ratio and the actual air-fuel ratio detected by the exhaust gas sensor;

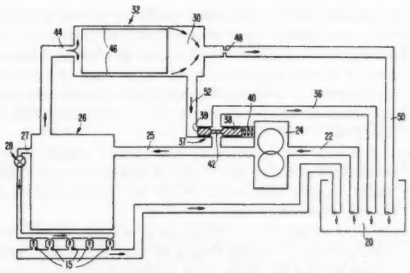
basic fuel setting means for setting a basic fuel injection quantity in dependency on the engine speed, the intake air quantity measured by said air measurement system, and a learning value from said learning means corresponding to said operational region; and

fuel quality setting means for setting an actual fuel injection quantity which is corrected by said learning value corresponding to said operational region of said fuel injection system in dependency on said basic quantity.

5,024,200
VISCOSITY RESPONSIVE PRESSURE REGULATOR AND TIMING CONTROL TAPPET SYSTEM INCORPORATING THE SAME

Paul D. Free; B. Doszpoly, both of Columbus, Ind.; Tibor J. Villanyi, Hanahan, S.C., and David A. Olson, Columbus, Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Jul. 27, 1989, Ser. No. 385,745
Int. Cl.[5] F02M *37/04*
U.S. Cl. 123—501 19 Claims



1. An engine timing control tappet system of the type having at least one expansible tappet for controlling timing of a fuel injector using oil that is supplied by a pump to an engine lubrication circuit, wherein said system includes viscosity sensitive means that is coupled to the engine lubrication circuit for producing a simulated pressure which varies in correspondence with the effect of changes in the viscosity of oil received from the engine lubrication circuit on the pressure regulating means responsive to changes in said simulated pressure for adjusting the pressure of oil supplied through said engine lubrication system to said tappets from said pump, wherein said viscosity sensitive means is coupled to the engine lubrication circuit by an oil rifle connection, and comprises a viscosity orifice, a pressure chamber, a regulator connection, and an exit orifice; said viscosity orifice being connected between the rifle connection and the pressure chamber and having a flow-through length and a cross-sectional area that produces a pressure drop from an upstream side to a downstream side thereof that is sensitive to changes in viscosity of oil passing therethrough; wherein said exit orifice has, in comparison to said viscosity orifice, a relatively short flow-through length and relatively small sensitivity to the viscosity of oil passing

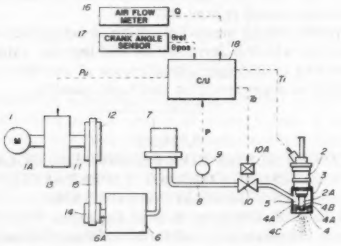
therethrough, said exit orifice being connected to a downstream side of the pressure chamber as a means for controlling the quantity of flow through said viscosity orifice: and wherein said regulator connection communicates said pressure regulating means with said pressure chamber.

5,024,201

ASSIST AIR SUPPLY SYSTEM FOR INTERNAL COMBUSTION ENGINE

Kazumitsu Kobayashi, and Hiroki Sunou, both of Gunma, Japan, assignors to Japan Electronic Control Systems Co., Ltd., Isezaki, Japan

Filed Aug. 29, 1989, Ser. No. 399,875
Claims priority, application Japan, Aug. 29, 1988, 63-214644
Int. Cl.[5] F02M *39/00*
U.S. Cl. 123—531 **20 Claims**



1. An assist air supply system for a fuel injection internal combustion engine comprising:

an assist air discharge nozzle provided for discharging a pressurized air in the vicinity of a fuel injected through a fuel injection valve;

a pressurized air supply means including means associated with an external driving power source to be driven by the driving force supplied therefrom, for generating a pressurized air having a pressure level higher than or equal to a predetermined level, and supplying a pressurized air to said assist air discharge nozzle in synchronism with fuel injection;

sensor means for monitoring preselected engine driving parameters affecting fuel injection amount and producing sensor signals representative of the monitored engine driving parameters; and

controlling means for receiving said sensor signals and determining assist air supply timing on the basis of said sensor signals so that the assist air is discharged in synchronism with fuel injection timing, said controlling means setting the timing of opening of a valve means so that the valve means opens at an earlier time than an opening time of said fuel injection valve, at a predetermined magnitude.

5,024,202

METERING OF FUEL

Michael L. McKay, Willeto., Australia, assignor to Orbital Engine Company Proprietary Limited, Balcatta, Australia

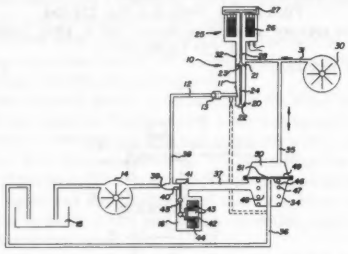
Division of Ser. No. 849,501, M 24, 6, Pat. 4,841,942.
This application May 5, 1989, Ser. No. 3[illegible],556
Claims priority, application Australia, Aug. 1, 1984, PG6327/84
Int. Cl.[5] F02M *23/00*
U.S. Cl. 123—533 **18 Claims**

1. Apparatus for metering fuel to an engine, comprising:

a chamber having an open fuel port, a selectively openable gas port and a selectively openable delivery port;

regulating means for regulating a pressure differential between the fuel and gas supplies at the fuel and gas ports in response to engine load; and

means for selectively opening said gas and delivery ports to deliver from the chamber when both said delivery and gas



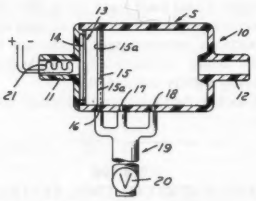
ports are open, the fuel in and fuel entering the chamber while the delivery port is open.

5,024,203

PCV OIL SEPARATOR SYSTEM

Stephen H. Hill, Muskegon, Mich., assignor to Sealed Power Technologies, L.P., Muskegon, Mich.

Filed Aug. 22, 1990, Ser. No. 571,322
Int. Cl.[5] F02M *25/00*
U.S. Cl. 123—573 **25 Claims**



1. In a positive crankcase ventilation system wherein a direct flow path of vapors is provided between the engine crankcase and the intake manifold by inducing differential pressure between the intake manifold and the crankcase, the method of separating oil from fuel and water in the vapor which comprises:

passing the vapors through at least one chamfered orifice,

directing the vapors toward an impactor plate,

impacting the vapors after they have passed through the orifice against an impactor plate,

controlling the temperature of the vapors, the size of the orifice, the distance between the orifice and the impactor plate such that the oil particles are separated from the vapor and the remaining vapor containing fuel and water passes on through the system.

5,024,204

CAPACITIVE DISCHARGE IGNITION SYSTEM WITH CONTINUOUS TIMING ADVANCE

Richard A. Dykstra, Cedar Grove, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed Jun. 29, 1990, Ser. No. 546,247
Int. Cl.[5] F02P *3/08*
U.S. Cl. 123—602 **17 Claims**

1. An advancing capacitive discharge ignition system for use with an internal combustion engine, comprising:

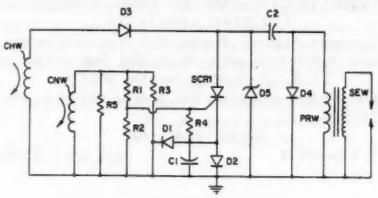
a charge capacitor whose discharge triggers ignition firing;

an ignition SCR in circuit connection with said charge capacitor and having a gate, an anode and a cathode, said charge capacitor discharging through said ignition SCR; 0

a control winding that generates an alternating signal waveform having positive and negative half-cycles; and

gate control means for receiving said alternating signal and

for gating on said ignition SCR during said positive half-cycle at low engine speeds and for gating on said ignition SCR during said negative half-cycle at high engine speeds,



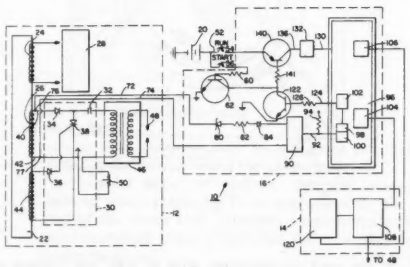
said gate control means gating on said ignition SCR progressively earlier in a substantially continuous manner along said alternating signal waveform as engine speed increases to achieve timing advance.

5,024,205

METHOD AND APPARATUS FOR CONSERVING BATTERY POWER IN A SNOWMOBILE ELECTRICAL SYSTEM

Ward K. Gatza, and Ronald E. Chasteen, both of Colorado Springs, Colo., assignors to Injection Research Specialists, Inc., Colorado Springs, Colo.

Filed Mar. 30, 1990, Ser. No. 502,410
Int. Cl.[5] F02P *11/00*
U.S. Cl. 123—632 **23 Claims**



1. In a snowmobile engine having a battery and at least one spark plug, an electronically controlled fuel system comprising:

fuel injection means for the delivery of fuel to said engine during the operation thereof;

ignition means for providing an electrical output to said spark plug sufficient to enable said plug to ignite s id fuel delivered by said fuel injection means;

electronic control means electrically connected to said battery for controlling the operation of said fuel injection means, said electronic control means comprising a microprocessor having detector means therein electrically coupled to said ignition means for determining when said electrical output of said ignition means drops below a minimum threshold level, said microprocessor further comprising signal generator means for generating a battery disconnection signal when said detector means determines that said electrical output of said ignition means is below said threshold level; and

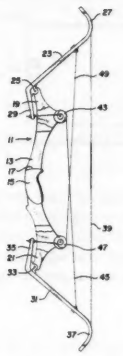
switch means electrically coupled between said battery and said microprocessor for receiving said battery disconnection signal from said signal generator means and disconnecting said electronic control means from said battery when said battery disconnection signal is received.

5,024,206

COMPOUND ARCHERY BOW

Wayne L. Lester, 3935 Willow Run, Flower Mound, Tex. 75028

Filed Dec. 16, 1988, Ser. No. 285,652
Int. Cl.[5] F41B *5/00*
U.S. Cl. 124—23.1 **8 Claims**



1. A compound archery bow assembly, comprising:

a handle having an upper end and a lower end;

an upper limb having an upper end and a lower end, the upper limb being pivotably connected to the upper end of the handle at a pivot point between the upper and lower ends of the upper limb;

a lower limb having an upper end and a lower end, the lower limb being pivotably connected to the lower end of the handle at a pivot point between the upper and lower ends of the lower limb;

a bowstring strung between the upper end of the upper limb and the lower end of the lower limb, the bowstring being movable between an undrawn position and a fully drawn position;

an upper pulley mounted on the handle and having a helical groove that makes three turns around the upper pulley, the diameter of one of the turns being different from the diameters of the other turns;

a lower pulley mounted on the handle and having a helical groove that makes three turns around the lower pulley, the diameter of one of the turns being different from the diameters of the other turns;

an upper tension cable connected to the upper limb above the pivot point and traveling around the lower pulley and connected to the upper end of the lower limb; and

a lower tension cable connected to the lower limb below the pivot point and traveling around the upper pulley and connected to the lower end of the upper limb.

5,024,207

HEATING APPARATUS AND METHOD FOR SEMICONDUCTOR MATERIAL SLICING PROCESS

Josephine A. Harbarger; David Oliver, and Ella L. Anthony, all of Phoenix, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

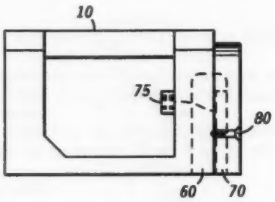
Continuation of Ser. No. 428,568, Oct. 30, 1989, abandoned. This application Sep. 10, 1990, Ser. No. 581,161
Int. Cl.[5] B28D *7/04*
U.S. Cl. 125—35 **4 Claims**

1. A method for slicing a material ingot comprising the steps of:

mounting said material ingot on a mounting face of a mounting block of a slicing apparatus with a thermally softenable adhesive to form a mounting block/material ingot combination;

inserting said mounting block/material ingot combination

into said slicing apparatus for slicing of said material ingot, wherein a residue of said material ingot remains attached to said mounting block after a portion of said material ingot has been sliced; and



removing said residue of said material ingot from said mounting block by energizing a heating element mounted on said mounting block to heat only a localized portion of said mounting block near said mounting face to soften the adhesive between the material ingot and the mounting face.

5,024,208

PORTABLE STOVE

Fred W. Hottenroth, Seal Beach, and Fred W. Hottenroth, III, Anaheim, both of Calif., assignors to ZZ Corp., Los Alamitos, Calif.

Filed Oct. 29, 1990, Ser. No. 605,081
Int. Cl.[5] F24B 3/00
U.S. Cl. 126—25 R **22 Claims**

1. A portable stove for burning charcoal and other solid fuels comprising:

a continuous vertically oriented insulative wall, said insulative wall having a continuous bottom edge, said insulative wall surrounding and defining in part a hollow fuel chamber, said fuel chamber having an open top;

a grate positioned adjacent said insulative wall proximal to said bottom edge of said insulative wall, said grate forming the bottom of said fuel chamber;

means for conducting combustion air between said bottom edge of said insulative wall and said grate;

a reflector plate positioned below said grate;

an air chamber means for channeling combustion air, said air chamber means surrounding said reflector and the under side of said grate and the bottom most portion of said side wall including said bottom edge and said means for conducting combustion air; and

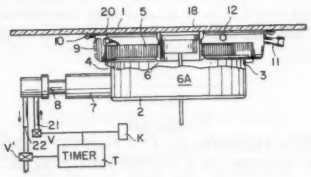
air control means for introducing air into said air chamber means in a controlled manner.

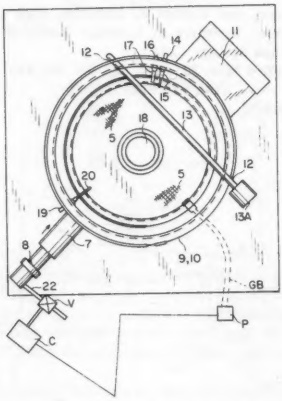
5,024,209

GAS COOKING APPLIANCE WITH AT LEAST ONE RADIANT GAS BURNER ARRANGED UNDERNEATH A GLASS CERAMIC PLATE, AS WELL AS PROCESS FOR REDUCING THE HEATING-UP TIME OF SUCH A GAS COOKING APPLIANCE

Kurt Schaupert, Hofheim-Wallau, Fed. Rep. of Germany, assignor to Schott Glaswerke, Mainz, Fed. Rep. of Germany

Filed Apr. 13, 1990, Ser. No. 508,616
Claims priority, application Fed. Rep. of Germany, Apr. 13, 1989, 3912124
Int. Cl.[5] F24C 3/00
U.S. Cl. 126—39 H **15 Claims**





1. A gas cooking appliance with at least one radiant gas burner having an exhaust gas side, the burner being positioned underneath a glass ceramic plate with a burner plate having a single combustion chamber, the appliance including a gas supply controller as well as customary ignition, safety, and temperature monitoring devices, the improvement comprising: a supplemental gas feed means activated when the appliance is switched on and when the gas supply controller is positioned at full load, the supplemental gas feed means feeding the single combustion chamber of the burner with an increased amount of gas that exceeds the amount of gas normally fed in a full load position of the gas controller; and means for deactivating the supplemental gas feed means upon the ceramic plate reaching the predetermined temperature to interrupt the flow of gas therethrough.

10. A process for reducing the heating-up time of a gas cooking appliance having at least one radiant gas burner with a single combustion chamber, a glass ceramic cooling plate, and customary power and safety devices, the process comprising: after ignition and during switching to full load, feeding the single combustion chamber of the burner with an amount of gas increased with respect to full load in normal operation and capable of damaging the glass ceramic cooking plate until the operating temperature of the burner plate has been reached and thereafter stopping the feed of the amount of gas.

5,024,210
WATER HEATER CONSTRUCTION

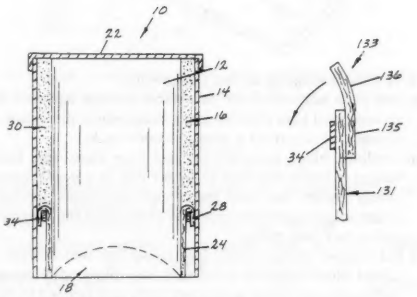
Thomas E. Nelson, Anchorage, Ky., assignor to Soltech, Inc., Shelbyville, Ky.

Continuation of Ser. No. 302,395, Feb. 23, 1989, Pat. No. 4,911,142, which is a division of Ser. No. 162,504, Mar. 1, 1988, Pat. No. 4,958,620, which is a division of Ser. No. 8,564, Jan. 29, 1987, Pat. No. 4,736,509. This application Jan. 22, 1990, Ser. No. 467,938

The portion of the term of this patent subsequent to Mar. 27, 2007, has been disclaimed.

Int. Cl.[5] F24H *1/00*

U.S. Cl. 126—344 **8 Claims**



1. A water heater comprising:

a water tank;

an outer shell concentrically located over the water tank defining an annular space therebetween;

a first annular sleeve of insulation material located in the annular space extending from approximately the bottom end of the water tank upwardly longitudinally thereof a predetermined distance less than the entire height of the water tank; and

a second annular sleeve of insulation material disposed in overlapping relation with said first annular sleeve of insulation material and folded into a cuff of double radial thickness which is disposed in overlapping relation with the top end of said first annular sleeve and compressed between said water tank and said outer shell.

5,024,211
HEAT EXCHANGE MEDIUM CONNECTOR FOR MOVABLE SOLAR HEATERS

Wilfried Winzen, Pforzheim, Fed. Rep. of Germany, assignor to Witzenmann GmbH Metallschlauch-Fabrik Pforzheim, Pforzheim, Fed. Rep. of Germany

Filed Jan. 2, 1990, Ser. No. 460,272

Claims priority, application Fed. Rep. of Germany, Jan. 5, 1989, 3900203

Int. Cl.[5] F24J *2/00*

U.S. Cl. 126—424 **15 Claims**

1. Fluid connection system for a heat exchange fluid exposed to a movable solar heater,

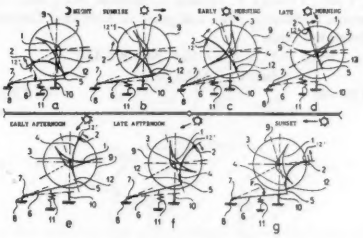
wherein said movable solar heater comprises

a movable mirror system (**1**) including a mirror which is pivotable about a mirror pivot axis (**3**) positionable in a direction at least approximately at right angles to the position of the sun at any given time during the day;

a heat exchange means (**2**) associated with the mirror system and positioned opposite said mirror pivot axis (**3**), with respect to said mirror, in a zone on which solar radiation reflected by said mirror is concentrated;

fluid connection means (**7, 8**) located at a fixed position with respect to said movable mirror system,:

a flexible hose (**4**) coupled to said heat exchange means (**2**) and bending upon movement of the mirror as the mirror follows the position of the sun; and



coupling means (**5, 6**) coupling the fixed fluid connection means (**7, 8**) to said flexible hose (**4**),

wherein, in accordance with the invention,

said coupling means is at least approximately radially movable with respect to said mirror pivot axis (**3**) and positioned opposite said mirror pivot axis, with respect to a connection of said flexible hose (**4**) with said heat exchange means.

5,024,212
ENDOSCOPE/RESECTOSCOPE AND SHIELD THEREFOR

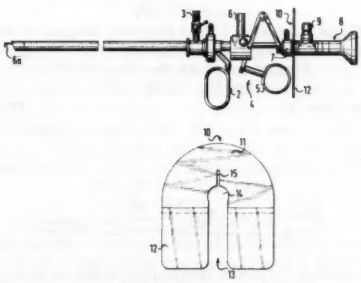
Ludwig Bonnet, Knittlingen, and Ulrich Wetterauer, Freiburg, both of Fed. Rep. of Germany, assignors to Richard Wolf GmbH, Knittlingen, Fed. Rep. of Germany

Filed Apr. 26, 1990, Ser. No. 514,908

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1989, 3918719

Int. Cl.[5] A61B *1/00*

U.S. Cl. 128—4 **8 Claims**



1. An endoscope, in particular a resectoscope for excising tissue, said endoscope having proximal and distal ends and comprising a barrel which is insertable into a body cavity, for feeding in and draining out an irrigating liquid and for carrying a working element which is actuatable from the proximal end of the endoscope and which has a field of activity that can be monitored visually through an endoscope telescope positioned at the proximal end of the endoscope, wherein a protective shield is releasably secured on a lengthwise segment of the endoscope, said lengthwise segment comprising those segments of the working element and of the endoscope telescope

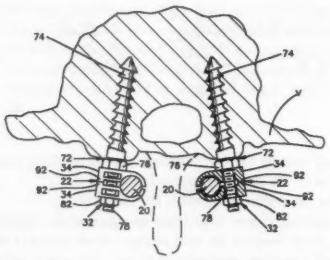
which project proximally from the barrel of the endoscope, the protective shield having a U-shaped configuration, with the two legs of the U being created by a cutout whose width is less than the diameter of at least one of the working element and telescope which carries the protective shield.

5,024,213

CONNECTOR FOR A CORRECTIVE DEVICE

Marc A. Asher, Prairie Village, Kans.; Walter E. Strippgen, Golden, Colo.; Charles F. Heinig, Charlotte, N.C., and William Carson, Columbia, Mo., assignors to AcroMed Corporation, Cleveland, Ohio

Filed Feb. 8, 1989, Ser. No. 308,430
Int. Cl.[5] A61F *5/00*
U.S. Cl. 128—69 **17 Claims**



1. An apparatus for connecting a bendable elongate rod with a vertebra, said apparatus comprising:

a body portion including a pair of axially spaced projections located in an opening in said body portion;

a connector portion fixed to and extending from said body portion for connecting said body portion with the vertebra; and

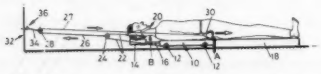
said projections of said body portion defining an arcuate recess located between said projections of said body portion, said projections including surfaces for engaging parts of the rod at axially spaced locations when said connector portion acts to connect said body portion with the vertebra.

5,024,214

APPARATUS FOR USE IN RELIEVING NECK AND/OR BACK PAIN

Leon Hayes, Liverpool, United Kingdom, assignor to Backeze Limited, Liverpool, United Kingdom

Filed May 8, 1989, Ser. No. 350,330
Int. Cl.[5] A61H *1/02*
U.S. Cl. 128—75 **13 Claims**



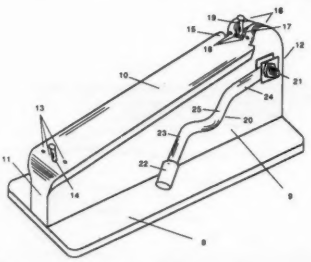
1. Apparatus for use in relieving neck and/or back pain in the person comprising a single movable support member on which the upper torso rests in use, and stationary support means next adjacent said support member on which the lower torso (buttocks) rests in use, a harness co-operable, in use, with the person and also secured to the movable support member, the apparatus further comprising a pulley adapted to be mounted on a stationary abutment, and means for applying a force to the harness which force it to act in use in a direction to urge the body and the movable support member in one and the same direction away from the stationary support means, which force applying means comprises at least one actuating line to which force is applied by the person through the arms thereof, in an opposite direction and which acts through said pulley to apply said force to the body and the movable support members.

5,024,215

BACK RACK FOR ALLEVIATING MUSCULO-SKELETAL TENSION

Jason Wang, 2245 Watt St., Reno, Nev. 89509

Filed Oct. 13, 1989, Ser. No. 421,111
Int. Cl.[5] A61H *1/02*
U.S. Cl. 128—75 **8 Claims**



1. A muscle relaxing device comprising:

a base plate adapted to rest in a stable position against a flat surface, said base plate having a longitudinal dimension of at least the length of a small person's back;

an inclined block mounted on said base plate, said block having a lower end and an upper end at a depth significantly higher than said lower end, said block having a longitudinal dimension approximately equal the longitudinal of said base plate;

a flat ramped surface extending along one side of said inclined block opposite from said base plate, said ramped surface having lower and upper ends, said ramped surface having a lateral dimension slightly wider than the width of a person's spine;

said inclined block further comprising projecting means extending upwardly from said higher end of said block, said projecting means having at least one curved surface which connects with said ramped surface at said upper end of said ramped surface, said projecting means having a lateral dimension slightly wider than the width of a person's thoracic area of the spine;

wherein tension within the muscles of a person's back may be relieved by lying down upon said curved surface of said projecting means;

wherein said ramped surface further comprises a hole, said hole extending downwardly into said block;

a pin of a dimension to be held by said hole,

wherein a point of pain within a person's neck or foot may be relieved by applying pressure to the point of pain against said pin when said pin is held within said hole.

5,024,216

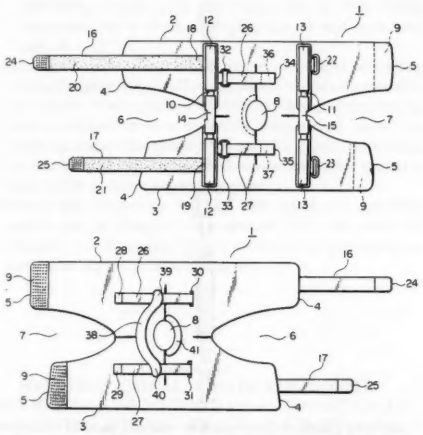
KNEE SUPPORT

Katuaki Shiono, Hatogaya, Japan, assignor to Tokyo Eizai Laboratory Co., Ltd., Japan

Filed Feb. 22, 1990, Ser. No. 483,910
Claims priority, application Japan, Feb. 23, 1989, 1-21169[U]
Int. Cl.[5] A61F *3/00*
U.S. Cl. 128—80 C **11 Claims**

1. A knee support comprising a main body having a knee portion for covering the knee joint and with thigh and shank portions located above and below the knee portion, said knee portion including a patella opening two straps which are respectively disposed extending in a lateral direction above and below said patella opening, one end of each of said straps being

fixed to the inside of said main body, while the other ends thereof are adapted to pass through and be detachably attached



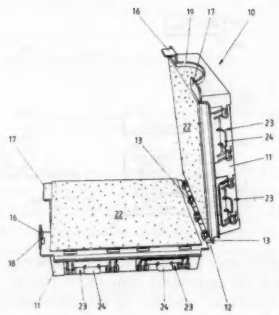
to the outside of said main body, and a patella pad fixed to said two straps so as to abut one side of said patella opening.

5,024,217

BANDAGE APPLICATOR

Dennis S. Spencer, Ingle Farm, Australia, assignor to Olemunda Pty. Ltd., Kilkenny, Australia

Filed Sep. 7, 1989, Ser. No. 404,419
Claims priority, application Australia, Sep. 14, 1988, PJ0422
Int. Cl.[5] A61F *13/00, 15/00*
U.S. Cl. 128—82 **5 Claims**



1. An applicator for applying adhesive plastics film to extremities of the human body, comprising:

a pair of moulded trays, respective soft resilient foam pads in each said tray of depth greater than the depth of the tray, a hinge joining corresponding first ends of the trays such that the foam pads are openable away from each other or closable to lie in face-to-face contiguity, and when so closed, leave gaps between the sides of the trays,

latch means releasably joining second ends of the trays which are opposite the first ends when the foam pads are in their face-to-face contiguity, each second end having a recess flange which co-operates with the recess flange of the other second end to form an access opening at the second end into which a patient can insert an extremity,

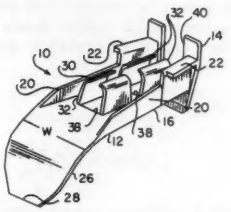
and film retaining clips extending along opposite sides of at least one of the trays.

5,024,218

INTUBATING AIRWAY

Andranik Ovassapian, Northbrook, and John F. Dye, Elgin, both of Ill., assignors to The Kendall Company, Mansfield, Mass.

Continuation-in-part of Ser. No. 112,004, Oct. 21, 1987, abandoned, Continuation of Ser. No. 848,677, Apr. 4, 1986, abandoned. This application Oct. 27, 1988, Ser. No. 266,284
Int. Cl.[5] A61M *16/00*
U.S. Cl. 128—200.26 **4 Claims**



1. An intubating airway adapted for insertion into the mouth of a patient, said airway comprising:

an elongated body having opposed first and second ends and a longitudinal axis extending therebetween;

a generally flat section adjacent to said first end;

faceplate means, transversely disposed across said first end of said body, for abutting against the lips, teeth or gums whereby to prevent said second end from advancing too far into the mouth;

curved, generally tongue-shaped portion means adjacent said second end, said curved portion means for permitting placement of said airway between the patient's maxillary and mandibular molars; and

flexible guide means for allowing insertion of a medical instrument in or removal of the instrument from said airway in a first, flexed, biased position but normally being in a second, relaxed, unbiased position, said guide means comprising at least one pair of opposed walls upstanding from only said flat section and extending longitudinally down said flat section, said walls being spaced apart and each said wall having an uppermost distal edge which is curved towards the opposed said wall, said distal edges being spaced apart whereby said edges may be flexed further apart to facilitate said insertion or said removal of the medical instrument within said airway.

5,024,219

APPARATUS FOR INHALATION THERAPY USING TRIGGERED DOSE OXYGENATOR EMPLOYING AN OPTOELECTRONIC INHALATION SENSOR

Henry G. Dietz, 80 Salisbury Ave., Garden City, N.Y. 11530

Continuation-in-part of Ser. No. 2,743, Jan. 12, 1987, abandoned. This application Jan. 30, 1989, Ser. No. 303,739
The portion of the term of this patent subsequent to May 24, 2005, has been disclaimed.
Int. Cl.[5] A61M *16/00*
U.S. Cl. 128—204.21 **2 Claims**

1. An apparatus to trigger a dose of breathable gas, including oxygen, from a tank under high pressure, to a human user when the user inhales, said apparatus comprising:

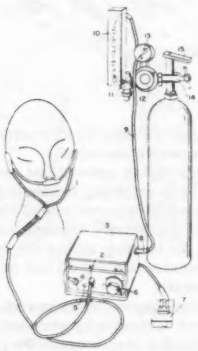
first pressure regulator means for operable connection to the tank of breathable gas to reduce the pressure of the breathable gas to a second lower pressure which is still above atmospheric pressure;

second pressure regulator means for operable connection to the first pressure regulator means to reduce the pressure of the breathable gas to a third still lower pressure;

flowmeter means for operable connection to the second pressure regulator means to measure the flow of the breathable gas;

optoelectronic inhalation sensor means for operable connec-

tion to the flowmeter means to receive the flow of the said breathable gas and to sense when inhalation occurs; said optoelectronic inhalation sensor having a flexible sensing diaphragm at a calibrated position for sensing individual negative pressures developed at each inhalation, optoelectronic means including sensing means for automatically sensing each movement of the diaphragm in response to said negative pressure developed during inhalation, means in said optoelectronic means for developing an electrical signal at each sensed movement of said diaphragm in response to sensing of the individual negative pressure developed at each said inhalation, means for connecting the sensor to a source of a breathable gas, and means to



apply said electrical signal to said source of breathable gas for control of supply of said gas to the sensor;

triggered dose oxygenator means for operable connection to the optoelectronic inhalation sensor means and to trigger a dose of the said breathable gas when the optoelectronic sensor means detects inhalation;

cannula means for operable connection to the triggered dose oxygenator means to detect the negative pressure of inhalation of the human user and to deliver the flow of said breathable gas to the human user when inhalation occurs;

electrical power means for operable connection to the triggered dose oxygenator means to supply a direct current from a line voltage wall transformer.

5,024,220

NASOTRACHEAL TUBE INSERTION CONNECTOR

W. Corbett Holmgreen, and Leonid Bunegin, both of San Antonio, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Filed Jul. 21, 1988, Ser. No. 222,550

Int. Cl.[5] A61M *16/04, 25/02, 39/00*

U.S. Cl. 128—207.18 **31 Claims**

1. A connector for coupling a tracheal tube to a supply of anesthesia gas, comprising:

a tubular body including along its length a flexible, peripherally integrious portion, said body defining a remote end having means for connecting said body to a supply of anesthesia gas, and a patient end terminating in an expandable, tapered tip to facilitate insertion of said body in a tracheal tube; and

an expansion collar adapted to be inserted and secured totally within said tip and configured to increase the diameter of said tip when inserted in the tracheal tube, such that the insertion of said collar in said tip results in a secure, substantially airtight fit between said connector and said tube, said collar, when inserted totally within said tip,

defining a first and second free end not used as a connecting means.

5,024,221

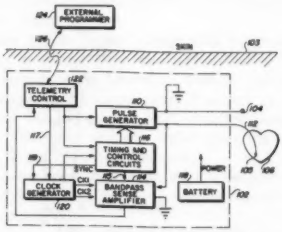
PROGRAMMABLE BAND-PASS AMPLIFIER FOR USE WITH IMPLANTABLE MEDICAL DEVICE

Wayne A. Morgan, Granada Hills, Calif., assignor to Siemens-Pacesetter, Inc., Sylmar, Calif.

Continuation-in-part of Ser. No. 735,251, May 17, 1985, abandoned. This application Nov. 17, 1987, Ser. No. 121,547

Int. Cl.[5] A61N *1/00*

U.S. Cl. 128—419 PG **14 Claims**



1. A programmable implantable medical device comprising:

a pacemaker for generating stimulation pulses;

a pair of electrodes coupled to the pacemaker for sensing electrical signals developed therebetween and for delivering said stimulation pulses to a desired location;

programmable band-pass amplifier means coupled to said electrodes for sensing and processing electrical signals, said programmable band-pass amplifier means including:

an amplifier having an input terminal and an output terminal, said electrical signals sensed by said electrodes being applied to said input terminal, said amplifier causing said electrical signals to be amplified by a desired gain factor and presented at the output terminal of said amplifier,

capacitor means for coupling to the amplifier,

switching means for switchably coupling said capacitor means to said amplifier, said switching means limiting the electrical signals amplified by said gain factor to those electrical signals having a frequency that falls within a band of frequencies bounded by a lower cut-off

frequency and an upper cut-off frequency, the upper and lower cut-off frequencies of said frequency band being controlled by the rate at which said capacitor means is switchably coupled to said amplifier by said switching means, said switching rate, in turn, being controlled by a clock signal applied to said switching means; and

clock signal generating means coupled to said switching means for generating said clock signal at one of a plurality of possible clock frequencies, said clock signal generating means responsive to a remotely telemetered signal for selecting one of the plurality of possible clock frequencies for controlling the rate at which said capacitor means is switchably coupled to said amplifier;

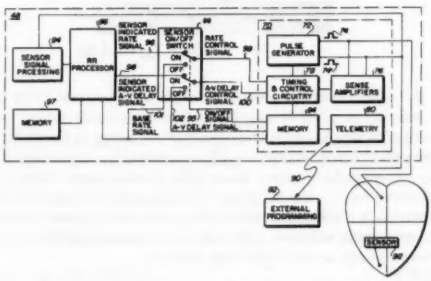
whereby the frequency band of said band-pass amplifier means can be changed to a desired value by remotely changing the frequency of the clock signal generated by said clock signal generating means.

5,024,222

HEMODYNAMICALLY RATE RESPONSIVE PACEMAKER AND METHOD OF AUTOMATICALLY ADJUSTING THE ESCAPE AND A-V INTERVALS

James R. Thacker, Canyon Country, Calif., assignor to Siemens-Pacesetter, Inc., Sylmar, Calif.

Filed Feb. 21, 1990, Ser. No. 482,603
Int. Cl.[5] A61N *1/00*
U.S. Cl. 128—419 PG **26 Claims**



1. In a dual chamber pacemaker, a system for optimizing cardiac output of a patient's heart, the pacemaker having a pulse generator for generating atrial and ventricular stimulation pulses and timing means for defining a pacing cycle having a stimulation rate and a A-V time interval between the atrial and the ventricular stimulation pulses, the stimulation rate and the A-V interval being adjustable in discrete steps, the system comprising:

a physiological sensor for sensing, during at least one cardiac cycle, a physiological parameter indicative of the cardiac output of the patient's heart;

means for determining an optimal stimulation rate corresponding to a maximum value of the physiological parameter;

means for adjusting the stimulation rate to a suboptimal stimulation rate, the suboptimal stimulation rate being at least one discrete step below the optimal stimulation rate;

means for determining an optimal A-V time interval, the optimal A-V time interval corresponding to a maximum value of the physiological parameter while the stimulation rate equals the suboptimal stimulation rate; and

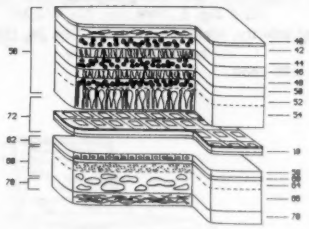
means for adjusting the A-V time interval to the optimal A-V time interval while the stimulation rate is at the suboptimal stimulation rate.

5,024,223

ARTIFICIAL RETINA DEVICE

Alan Y. Chow, 191 Palamino Pl., Wheaton, Ill. 60187

Continuation-in-part of Ser. No. 390,562, Aug. 8, 1989. This application Jul. 6, 1990, Ser. No. 549,094
Int. Cl.[5] A61N *1/00*; A61F *2/14*; A61B *17/00*
U.S. Cl. 128—419 R **20 Claims**



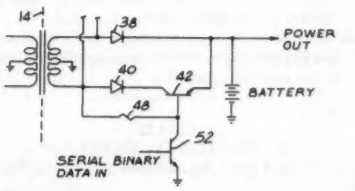
1. An artificial retina device, comprising: a plurality of discrete photodiodes, disposed on one surface of a substrate said photodiodes each including an active electrode layer overlaying a photosensitive layer, each photodiode being connected to an electrical ground, wherein said active electrode layer and ground are made from materials selected from aluminum, platinum, chromium, gold, conductive silicon, or combinations thereof, said photodiodes having electrical outputs that correspond to the amplitude of light incident on said device, whereby said device can stimulate individual or small groups of cells in the inner retinal layer of the eye, corresponding to the light incident on said device.

5,024,224

METHOD OF READOUT OF IMPLANTED HEARING AID DEVICE AND APPARATUS THEREFOR

A. Maynard Engebretson, Ladue, Mo., assignor to Storz Instrument Company, St. Louis, Mo.

Filed Sep. 1, 1988, Ser. No. 239,556
Int. Cl.[5] A61N *1/00*
U.S. Cl. 128—420.6 **8 Claims**



1. A method of conveying signals from a hearing aid with an implanted device having an impedance to a device located external to the body of the implant wearer and inductively coupled to said implanted device, the improvement comprising:

modulating the impedance of said implanted device in accordance with a first signal to be conveyed;

using said externally located device to deliver energy to said implanted device in amounts which vary in accordance with the modulated impedance of said implanted device;

using said externally located device to ascertain the amounts of energy delivered to said implanted device, said amounts of energy being indicative of the modulated impedance of said implanted device;

from said ascertained amounts of energy delivered using said externally located device to ascertain said first signal, whereby said first signal is conveyed from said implanted device to said externally located device;

wherein said first device includes a rectification means

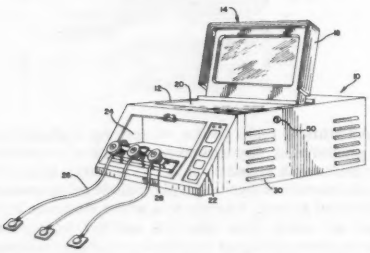
switchable between modes of half wave and full wave rectification and wherein said modulating step is performed by using said first signal to cause said rectification means to switch between said modes.

5,024,225

PERSONAL HEALTH MONITOR ENCLOSURE

William Fang, 1677 Apache Dr., Naperville, Ill. 60540

Filed Jan. 5, 1990, Ser. No. 461,249
Claims priority, application Canada, Sep. 26, 1989, 613,116
Int. Cl.[5] A61B 5/04
U.S. Cl. 128—630 19 Claims



1. In a personal health monitor of the type comprising a personal computer capable of implementing a program to determine one or more clinical parameters of a patient and further in which the personal computer includes a display screen portion that folds up from a keyboard portion, an improvement comprising:

a housing that comprises:

a first compartment of a size adapted to contain the keyboard portion of the personal computer and allow the display screen portion of the personal computer to extend above said first compartment,

a keyboard cover capable of covering the keyboard portion of the personal computer while the display screen portion of the personal computer is extended into position above said first compartment in order to prevent access to the keyboard portion while the display screen portion is viewable by the patient, and

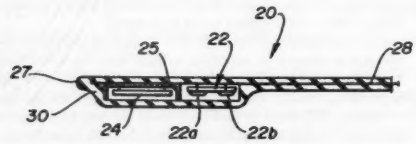
an input panel located outside of said first compartment and capable of conveying input signals from the patient to the personal computer.

5,024,226

EPIDURAL OXYGEN SENSOR

Josef K. S. Tan, Tampa, Fla., assignor to Critikon, Inc., Tampa, Fla.

Filed Aug. 17, 1989, Ser. No. 394,997
Int. Cl.[5] A61B 5/00
U.S. Cl. 128—633 12 Claims



1. A sensor for measuring cerebral oxygen availability through a burr hole in the skull by optical reflectance comprising:

a length of flexible wiring having (a) a distal end and (b) a proximal end which is to be connected to an oximeter;

a photodetector electrically connected to said flexible wiring in the proximity of said distal end;

a pair of light emitting diodes connected to said flexible wiring adjacent to said photodetector; and

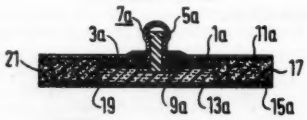
a coating encapsulating said photodetector, said light emitting diodes, and said flexible wiring in the proximity of said photodetector and said light emitting diodes, said coating including optical windows where said coating overlies the optical windows of said photodetector and said light emitting diodes which is transmissive to light at the wavelengths of said light emitting diodes, said encapsulated photodetector and said light emitting diodes having a width less than about 20 mm to fit through the diameter of said burr hole and a thickness less than about 4 mm to slide between the skull and dura.

5,024,227

BIOELECTRICAL ELECTRODE

Walter Schmid, Pfaffenhofen, Fed. Rep. of Germany, assignor to ARBO Medizin-Technologie GmbH, Braunschweig, Fed. Rep. of Germany

Continuation of Ser. No. 930,308, Oct. 31, 1986, abandoned.
This application Apr. 29, 1988, Ser. No. 188,753
Claims priority, application Fed. Rep. of Germany, Mar. 1, 1985, 3507301
Int. Cl.[5] A61B 5/04
U.S. Cl. 128—640 35 Claims



1. A bioelectrical electrode, with an electrode body (1) consisting of metal at least on its skin-side contact surface and with a conductive adhesive layer (13) covering at least part of the skin-side contact surface, (3), wherein the conductive adhesive layer is formed as a layer (13) of an aqueous dispersion adhesive having the property of being pressure-sensitive and containing a substance which dissociates in aqueous solution wherein said adhesive comprises an aqueous dispersion of a thermoplastic acrylic resin and gelatin.

5,024,228

ELECTRODE ENDOTRACHEAL TUBE

Andrew C. Goldstone, 4000 N. Charles St., Apt. 511, Baltimore, Md. 21218, and Raymond L. Schettino, 8402 Chapel Hill Ct., Baltimore, Md. 21237

Filed Nov. 29, 1989, Ser. No. 442,901
Int. Cl.[5] A61B 5/0488
U.S. Cl. 128—642 7 Claims

1. An apparatus for monitoring the EMG signals of the laryngeal muscles, said apparatus comprising:

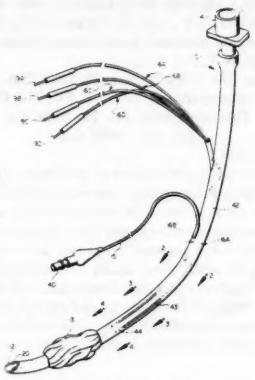
an endotracheal tube formed from a flexible, nonelectrically conducting material and having a distal end, a proximal end, an exterior surface and a central axis;

at least one electrode wire composed of electrically conducting material running in a direction parallel to said central axis at a location between said distal end and said proximal end;

said electrode wire having an electrically insulated first wire portion located between said ends and an electrically uninsulated second wire portion, located between said first wire portion and said distal end, on the exterior surface of said endotracheal tube;

said second wire portion comprising means for contacting

said laryngeal muscles when said endotracheal tube is placed in the trachea for ventilation; and



electrical connecting means for attaching said electrode wire to a machine which processes EMG signals.

5,024,229

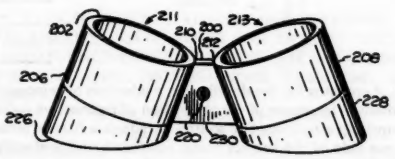
RESONATORS FOR MAGNETIC RESONANCE IMAGING

Robert G. Bryant, Pittsford; Joseph P. Hornak, Scottsville, and Eric A. Marshall, Rochester, all of N.Y., assignors to The University of Rochester, Rochester, N.Y.

Continuation of Ser. No. 121,565, Nov. 16, 1987, abandoned. This application Jan. 24, 1990, Ser. No. 471,663

Int. Cl.[5] A61B *5/055*

U.S. Cl. 128—653 SC **2 Claims**



1. A solenoidal resonator for use in magnetic resonance imaging of the breast of a subject, comprising a pair of tubular cylinders of dielectric material having bottom and top ends, a trapezoidal plate of dielectric material having opposite side edges each attached to and forming a bridge between said cylinders and locating said cylinders canted toward each other with their said top ends closer together than their said bottom ends, rectangular bands of conductive material extending around each of said cylinders and defining slits extending along the side edges of said plate, said bands also extending over opposite sides of said plates to define single turn solenoidal coils around said cylinders and a capacitor with said plate, said coils and capacitor defining a circuit in resonance at RF frequency, and means in electromagnetically coupled relationship with said circuit for supplying and sensing RF energy.

5,024,230

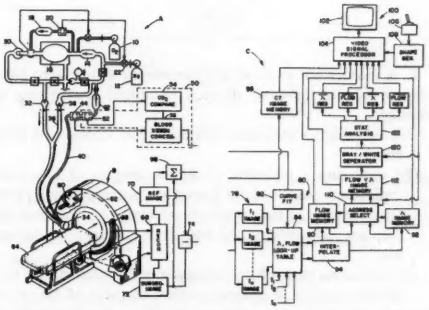
DUAL FLOW/LAMBDA DISPLAY FOR XENON ENHANCED TOMOGRAPHY

Walter W. Lindstrom, Shaker Hts., and Isaac Dinewitz, Cleveland Hts., both of Ohio, assignors to Picker International, Inc., Highland Hts., Ohio

Continuation-in-part of Ser. No. 275,784, Nov. 23, 1988, which is a continuation-in-part of Ser. No. 933,781, Nov. 24, 1986, Pat. No. 4,793,357. This application Mar. 17, 1989, Ser. No. 325,206

Int. Cl.[5] A61B *6/00*

U.S. Cl. 128—654 **18 Claims**



1. An apparatus for producing flow and partition coefficient data for gray and white matter brain tissue, the apparatus comprising:

a flow and partition coefficient producing means for producing corresponding flow and partition coefficient values for each of a plurality of spatial locations;

a selecting means for selecting a region of the spatial locations;

a means for separation a pair of flow and partition coefficient values corresponding to each spatial location in the selected region into a group representing gray matter brain tissue and a group representing white matter brain tissue;

a statistical analysis means for analyzing the flow and partition coefficient pairs for each of the gray and white matter groups to determine at least one of an average flow value

for the gray matter group, an average flow value for the white matter group, and average partition coefficient value for the gray matter group, an average partition coefficient for the white matter group, a median flow value for the gray matter group, a median flow value for the white matter group, a median partition coefficient value for the gray matter group, a median partition coefficient value for the white matter group, a flow value distribution for the gray matter group, a flow value distribution for the white matter group, a partition coefficient value distribution for the gray matter group, and a partition coefficient value distribution for the white matter group.

5,024,231

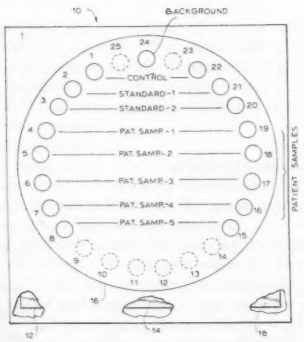
AUTOMATED MULTI-POINT BLOOD VOLUME ANALYZER

Joseph Feldschuh, New York, and Jonathan A. Feldschuh, Barrytown, both of N.Y., assignors to Daxor Corporation, New York, N.Y.

Continuation of Ser. No. 203,715, Jun. 7, 1988, abandoned. This application May 14, 1990, Ser. No. 522,741

Int. Cl.[5] A61B *6/00*

U.S. Cl. 128—654 **12 Claims**



1. A multi-point method of determining a time-zero blood volume by the indicator dilution technique comprising the steps of:

(A) injecting an indicator into the blood stream of a living being;

(B) removing a plurality of mixed samples of blood and indicator from the blood stream at a corresponding plurality of measured time intervals subsequent to the injecting step and determining the hematocrit of each mixed sample;

(C) providing means for automatically determining the level of indicator in a plasma portion of each of the mixed samples relative to prepared standards, for automatically calculating for each mixed sample the apparent plasma volume from the indicator level, for automatically calculating for each mixed sample the apparent blood volume from the apparent plasma volume and hematocrit, for automatically calculating a time-zero blood volume from the calculated apparent blood volumes and time intervals, and for recalculating the time-zero blood volume without using any calculated apparent blood volume which reflects an indicator level which is out of line with the others; and

(D) providing as input to such means plasma portions of the mixed samples, the hematocrits, and the time intervals and causing said means to automatically calculate the time-zero blood volume.

5,024,232

NOVEL RADIOPAQUE HEAVY METAL POLYMER COMPLEXES, COMPOSITIONS OF MATTER AND ARTICLES PREPARED THEREFROM

Johannes Smid, Lafayette; Israel Cabasso; Alan Obligin, both of Syracuse, all of N.Y., and H. Ralph Rawls, Boston, Mass., assignors to The Research Foundation of State University of NY, Albany, N.Y.

Division of Ser. No. 273,662, Nov. 18, 1988, Pat. No. 4,882,392, which is a continuation of Ser. No. 916,182, Oct. 7, 1986, abandoned. This application Jul. 25, 1989, Ser. No. 385,237

Int. Cl.[5] A61B *6/00*

U.S. Cl. 128—654 **22 Claims**

1. A medical device fabricated at least in part from a composition comprising a radiopaque polymer, said polymer derived from a heavy metal Lewis acid radiopacifying salt and at least one Lewis base monomer selected from the group consisting of alkyl and vinyl alkyl ketones, alkyl and aryl esters of unsaturated carboxylic acids, vinyl esters of carboxylic acids, cellulose esters of carboxylic acids, linear and crosslinked polyesters, said salt being molecularly bound to said polymer to form a clear, homogeneous, substantially nonleachable material, said composition being substantially free of unbound radiopacifying salt.

5,024,233

APPARATUS FOR DISTRIBUTION EVALUATION OF REGIONAL LUNG VENTILATION

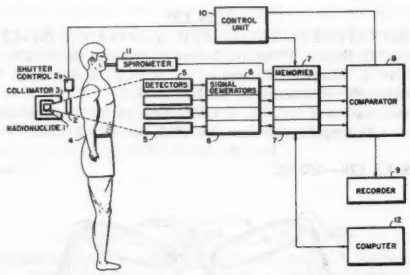
Cyril Simecek, Pilsen, and Jiri Ryba, Merklin, both of Czechoslovakia, assignors to TESLA, koncernovy podnik, Prague, Czechoslovakia

Continuation-in-part of Ser. No. 356,324, Mar. 10, 1982, abandoned. This application Apr. 10, 1984, Ser. No. 598,805

Claims priority, application Czechoslovakia, Mar. 13, 1981, 1836-81

Int. Cl.[5] A61B *5/08*

U.S. Cl. 128—659 **3 Claims**



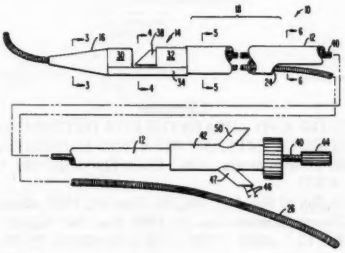
1. Apparatus for the distribution evaluation of regional lung ventilation by means of the absorption of radioactive radiation comprising a radionuclide source of radiation fixedly mounted on one side of the subject being examined, and a plurality of scintillation detectors arranged on the opposite side of said subject in alignment with given fields of said lungs, respectively, for simultaneously sensing the passage of radiation through said subject, the outputs of said scintillation detectors being connected to an input of an associated evaluation unit, respectively, the output of each of said evaluation units being connected to the input of an associated sector of a memory, respectively, the output of each sector of said memory being connected to a comparison block, the output of said comparison block being connected to a recorder, said comparison block and said memory having further inputs connected to a controlling unit, thereby enabling successive comparison of the signals respectively associated with the given fields of said lungs, in which a spirometer is connected to an associated sector of the memory, and the respective output of the memory is connected to the comparison block.

5,024,234

ULTRASONIC IMAGING CATHETER WITH GUIDEWIRE CHANNEL

James J. Leary, Sunnyvale, and John R. McKenzie, San Francisco, both of Calif., assignors to Cardiovascular Imaging Systems, Inc., Sunnyvale, Calif.

Filed Oct. 17, 1989, Ser. No. 422,935
Int. Cl.[5] A61B *8/14*
U.S. Cl. 128—663.01 **7 Claims**



1. An imaging catheter comprising:

a flexible catheter body having proximal and distal ends and a channel capable of receiving a movable guidewire extending between a first port on the periphery of the catheter body located a preselected distance proximally of the distal end and a second port on the periphery of the catheter body located adjacent the distal end;

a substantially rigid housing secured to the distal end of the flexible catheter body, said housing having a substantially rigid radially-offset channel which is aligned with channel on the catheter body and capable of receiving the guidewire from the second port thereof;

means within the housing for scanning an ultrasonic imaging signal across an environment surrounding the housing, wherein the means for scanning includes a fixed ultrasonic transducer and a rotatable mirror; and

a flexible conical tip secured to a distal end of the housing and having a channel which is aligned with the channels on the catheter body and the housing and extending between a first port at the base of the tip and a second port at a conical apex of the tip, wherein the first port on the tip is capable of receiving the guidewire from the channel on the housing.

5,024,235

ELECTROENCEPHALIC NEUROFEEDBACK APPARATUS AND METHOD FOR BIOELECTRICAL FREQUENCY INHIBITION AND FACILITATION

Margaret A. Ayers, 10623 Bloomfield, Toluca Lake, Calif. 91602

Filed Feb. 26, 1990, Ser. No. 484,824
Int. Cl.[5] A61B *5/0482*
U.S. Cl. 128—732 **12 Claims**

1. An improved method of inhibiting or facilitating analog bioelectrical frequencies in a person's body comprising the steps of:

(a) detecting an analog bioelectrical signal at a selected location of the person's body;

(b) amplifying said analog bioelectrical signal;

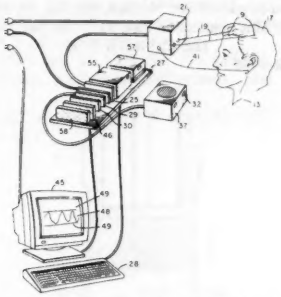
(c) converting the analog bioelectrical signal to digital signals representing particular frequencies;

(d) selecting a particular digital signal of interest;

(e) processing said particular digital signal of interest through a computing means using non-bandpass and non-power spectral analysis techniques and establishing an amplitude threshold voltage without delay and distortion resulting from bandpass and power spectral analysis for said particular digital signal;

(f) sending a signal to the person when said particular digital signal of interest falls within said amplitude threshold for a predetermined duration; and

(g) causing the person to mentally concentrate so as to affect



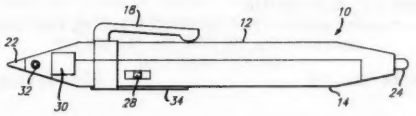
the amplitude of said particular digital signal of interest, thereby affecting a certain corresponding analog bioelectrical frequency emitted at said selected location of the person's body.

5,024,236

PHOTOPROBE ASSEMBLY

Ronald S. Shapiro, Toledo, Ohio, assignor to Advanced Medical Technology, Inc., Monroe, Mich.

Filed Oct. 5, 1988, Ser. No. 253,488
Int. Cl.[5] A61B *5/05*
U.S. Cl. 128—735 **9 Claims**



1. An apparatus for detecting acupuncture points on the skin of a living subject by detecting an area of reduced skin impedance and for stimulating acupuncture points on the skin of a living subject by pulsed light radiation, comprising:

a housing;

a light emitting diode within said housing;

a probe provided on one end of said housing;

a source of electric current disposed within said housing;

first circuit means disposed within said housing for providing said light emitting diode with a pulsed current from said source of electric current; and

second circuit means disposed within said housing and connected with said probe,

said second circuit means including means for measuring an initial reference impedance for said living subject when said probe is placed in contact with said skin of said living subject at a first location and thereafter being operative to provide a signal indicative of an impedance less than said initial reference impedance of said subject when said probe is moved to another location on said skin of said living subject, said signal being indicative of an acupuncture point to be stimulated by said light emitting diode.

5,024,237

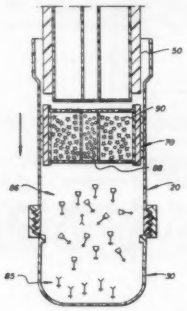
MODULAR FLUID SAMPLE PREPARATION ASSEMBLY

Raouf A. Guirguis, Rockville, Md., assignor to La Mina Ltd., British Virgin Isls.

Continuation-in-part of Ser. No. 308,763, Jan. 10, 1989, Pat. No. 4,961,432. This application Jun. 21, 1989, Ser. No. 369,610

Int. Cl.[5] A61B 5/00

U.S. Cl. 128—760 23 Claims



1. An apparatus for collecting molecular specimens from biological fluids comprising a tubular container; a specimen collection storage unit removably mounted in said tubular container, said specimen collection storage unit comprising a container divided into at least two separate testing compartments, a first test means with a predetermined antigen bound thereto positioned in one testing compartment and a control test means without said predetermined antigen positioned in another of said testing compartments; and membrane means mounted to said collection storage unit to visually indicate the presence of specific molecular specimens.

5,024,238

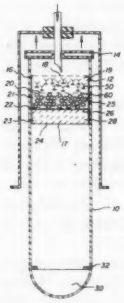
BLOOD WITHDRAWING APPARATUS AND ANTIGEN TESTING METHOD

Raouf A. Guirguis, Rockville, Md., assignor to Cancer Diagnostics, Inc., Rockville, Md.

Continuation-in-part of Ser. No. 308,763, Jan. 10, 1989. This application Sep. 18, 1989, Ser. No. 408,547

Int. Cl.[5] A61B 5/00

U.S. Cl. 128—771 17 Claims



1. An apparatus for testing molecular specimens in biological fluids comprising a fluid container; a specimen treatment unit mounted in said fluid container, said specimen treatment unit comprising means defining a plurality of fluid treatment compartments which allow fluid flow therethrough, a primary labelled antibody means contained in one of said fluid treatment compartments, a predetermined antigen matched to said primary labelled antibody means is covalently bound to bead means contained in another of said fluid treatment compartments, and a solution carrying means containing a reactive colorization material is contained in another of said fluid treatment compartments.

5,024,239

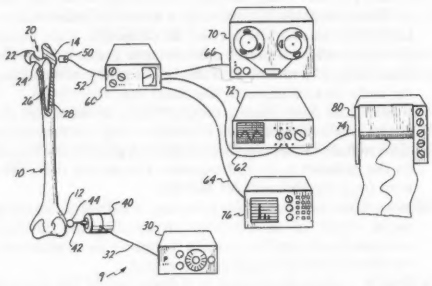
METHOD AND APPARATUS FOR DETERMINING OSSEOUS IMPLANT FIXATION INTEGRITY

Alexander D. Rosenstein, 31862 Coast Hwy. Ste. 302, Laguna, Calif. 92677

Continuation of Ser. No. 290,240, Dec. 21, 1988, abandoned. This application Jan. 11, 1990, Ser. No. 463,427

Int. Cl.[5] A61B 5/103, 7/00, 5/00; G01H 13/00

U.S. Cl. 128—774 13 Claims



1. A method for determining, without the utilization of base line information, the integrity of a heterogeneous composite substrate of an implant fixation in a bone of a limb of a patient, the substrate including a bone to cement interface and a cement to implant fixation interface, comprising:

using a vibrator having a smoothly contoured member;

compressing firmly with the contoured member, the flesh of the limb to the bone and to the implant fixation, of the substrate, over a large outer surface area of the limb, to enable vibrations to be imparted through the compressed flesh and through said heterogeneous composite substrate, to the bone, with little discomfort or damage to the limb;

supplying to said vibrator an input energizing electrical signal having a predetermined recurring pattern of a single non-resonant frequency;

vibrating the heterogeneous composite substrate, including each one of the interfaces thereof in response to the vibrator being energized by said input signal;

using a single pick-up device;

pressing the pick-up device into engagement with the outer surface of the limb spaced from the vibrator at the same bone, for detecting the vibratory motion of the bone implant heterogeneous composite substrate, to generate a single output electrical signal;

analyzing said input energizing electrical signal relative to the recurring pattern only of the single output electrical signal transmitted through the bone implant heterogeneous composite substrate and each one of said interfaces, without the utilization of base line information; and

determining implant loosening when said recurring pattern of said output signal is persistently distorted.

5,024,240

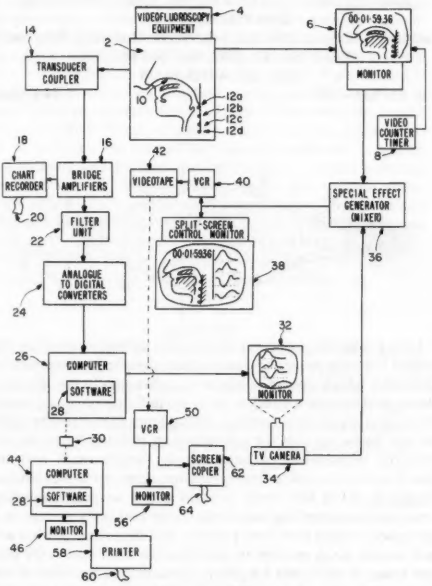
MANOFLUOROGRAPHY SYSTEM, METHOD FOR FORMING A MANOFLUOROGRAM AND METHOD FOR PREPARING A SWALLOWING PROFILE

Fred M. S. McConnel, 180 Blackland Dr., Atlanta, Ga. 30342

Filed Jan. 3, 1989, Ser. No. 293,049

Int. Cl.[5] A61B *5/103*

U.S. Cl. 128—780 **38 Claims**



1. A system for forming a combined magnetic recording of (a) the location and movement of a radiopaque bolus in a patient's alimentary tract over a period of time and (b) data indicating pressures exerted on said bolus during said period of time, the system comprising:

a catheter carrying a plurality of radiopaque pressure sensors for inserting in an alimentary tract, each said sensor for outputting electronic signals in response to the application of pressure to the sensor, said signals being reflective of the amount of said pressure;

means for processing said electronic signals so as to output a series of first magnetically recordable signals representative of a plurality of synchronized graphs (one graph for each said sensor) of pressure-versus-time data points that indicate the magnitude and timing of the pressures experienced by said sensors;

videofluoroscopy means for producing a series of second magnetically recordable signals representative of a series of images of at least a portion of an alimentary tract and a radiopaque bolus situated therein over a period of time; and

means for recording both said series of first and second magnetically recordable signals on a single magnetic medium, in such a manner that the resultant combined recording can be played back to simultaneously display on the same monitor screen said images and said graphs in the same sequence in which they were created, with each said displayed image lagging by less than 0.1 second the last-entered pressure-versus-time data point in each graph appearing therewith on the screen.

5,024,241

METHOD AND APPARATUS FOR MANUFACTURING A ROD OF TOBACCO OR THE LIKE ENCLOSED BY A PAPER STRIP, AND CIGARETTE MANUFACTURED BY SAID METHOD

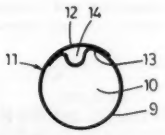
Severien Hulsman, Doesburg, and Johannes H. A. G. Salemink, Aerdt, both of Netherlands, assignors to Turmac Tobacco Company B.V., Zevenaar, Netherlands

Filed Feb. 22, 1990, Ser. No. 483,354

Claims priority, application Netherlands, Mar. 31, 1989, 8900787

Int. Cl.[5] A24C *5/18, 5/10;* **A24D** *1/02*

U.S. Cl. 131—84.2 **15 Claims**



1. Method for manufacturing a rod of a material to be smoked enclosed by a paper strip, wherein a paper strip is supported and transported by a garniture tape and the material to be smoked is deposited on the paper strip, wherein the material to be smoked is compressed into a material core and a channel is formed in the material core, said paper strip having first and second longitudinal edge parts and being closed with its longitudinal edge parts around the compressed material core, wherein the channel is formed in the circumference of the rod during said compressing, wherein the second longitudinal edge part of the paper strip is folded into the channel and the first longitudinal edge part is subsequently laid over said channel.

5,024,242

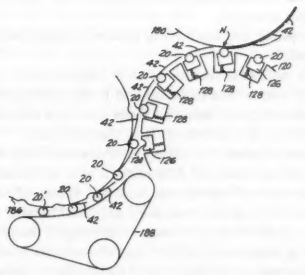
METHODS AND APPARATUS FOR MAKING MULTIPLE COMPONENT SMOKING ARTICLES

Martin T. Garthaffner, Midlothian; Billy J. Keen, Jr., Chesterfield; Andrew J. Gillespie; Jack C. Wheless, both of Richmond, and George W. Dingus, Cartersville, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Apr. 27, 1989, Ser. No. 343,732

Int. Cl.[5] A24C *5/60*

U.S. Cl. 131—94 **41 Claims**



1. Apparatus for making smoking articles having at least one substantially cylindrical component having a longitudinal axis and a finite length, said component being radially relatively rigid but fragile and requiring circumferential wrapping with a web-like overwrap which is separately supplied to said apparatus, said apparatus comprising:

means for supporting and transporting said component toward said overwrap in a direction perpendicular to the

longitudinal axis of said component so that an axial portion of the outer surface of said component is initially exposed; and

means for supporting and transporting said overwrap toward said component in a direction perpendicular to the longitudinal axis of said component so that at least a portion of one of the web-like surfaces of said overwrap is initially exposed and so that said initially exposed portions of said component and said overwrap contact one another, at least one of said means for supporting and transporting being resiliently movable at the initial location of said contact (1) along an axis normal to the portion of the outer surface of said component which thus contacts said web-like surface portion of said overwrap and, (2) in the direction along said normal axis away from the other of said means for supporting and transporting to prevent excessive radial pressure on said component during said contact.

5,024,243

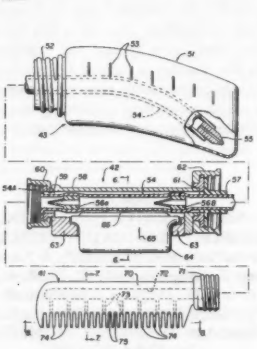
COMB FOR PRACTICING SELECTIVE HAIR COLORING

Susan L. Snyder, 5917 Erving St., Springfield, Va. 22150

Division of Ser. No. 857,347, Apr. 30, 1986, which is a continuation of Ser. No. 309,767, Oct. 8, 1981, abandoned, which is a continuation of Ser. No. 856,539, Dec. 1, 1977, abandoned. This application Jan. 10, 1990, Ser. No. 463,193

Int. Cl.[5] A45D *24/22*

U.S. Cl. 132—116 **31 Claims**



1. A hair coloring apparatus comprising:

a thixotropic hair coloring material;

a reservoir section adapted to contain said thixotropic hair coloring material;

a handle-pump section having means to pump hair coloring material;

manually actuated means in said handle-pump section to actuate said means to pump and to thereby suck thixotropic hair coloring material from one end of said handle-pump section and deliver it to the other end;

said means to pump delivering an amount of thixotropic hair coloring material and delivering it at a rate determined by the amount of movement and the speed of movement, respectively, of said manually actuated means;

whereby controlled continuous pumping of thioxtropic hair coloring material is achieved in accordance with progressive manual squeezing of said manually actuated means;

a comb-head section having a comb, bores in the spine of said comb for delivering thixotropic hair coloring material in said bores to the base of selected gullets between the teeth of said comb;

there being unselected gullets, located between said selected gullets having no bores and to which no thixotropic hair coloring materials is delivered;

means to detachably affix said reservoir section to the suctin end of sid handle-pump means can suck thirotropic hair coloring material from saaid reservoir section; and

means to detachably affix said comb-head to said delivery end of said handle-pump in operative relationship, whereby said pump means can deliver thixotropic hair coloring material sucked from said reservoir through the handle-pump to the bores in said spine and to said elected gullets.

5,024,244

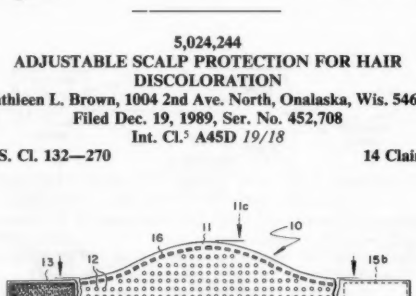
ADJUSTABLE SCALP PROTECTION FOR HAIR DISCOLORATION

Kathleen L. Brown, 1004 2nd Ave. North, Onalaska, Wis. 54650

Filed Dec. 19, 1989, Ser. No. 452,708

Int. Cl.[5] A45D *19/18*

U.S. Cl. 132—270 **14 Claims**



1. A protective covering device for partially covering the scalpal hair of a patron and selectively discoloring hair strands therewith which device comprises a substantially flat, thermoplastic body portion sized so as to partially cover a portion of the scalpal region of a patron, a multiplicity of indices throughout the body portion for providing an indexed body for the selective withdrawal of hair strands therethrough and the discoloration thereof, a first appending strap portion extending outwardly from said body portion and a second appending strap portion extending outwardly from said body portion and oppositely to said first strap portion, said first strap portion and said second strap portion in combination with said body portion being of sufficient length to circumscribe the head of the patron, and means for variably adjusting and securing together the first strap portion and second strap portion about the head of the patron.

5,024,245

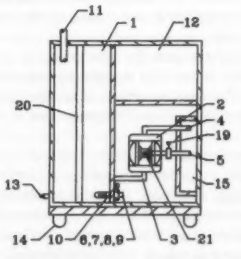
PNEUMATIC DESEDIMENTATION MACHINE IMPROVEMENT

Jerry L. Jay, Sr., Rte. #3, Box 239, Newbern, Tenn. 38059, and William R. Holifield, III, 1001 Brentwood Pl., Nashville, Tenn. 37211

Filed Dec. 11, 1989, Ser. No. 448,238

Int. Cl.[5] B08B *9/02*

U.S. Cl. 134—108 **2 Claims**



1. A device for the removal of deposits from the inside of remote machinery, equipment, or system where sedimentation may occur, by providing a constant flow of solvent or solution

through the machinery equipment or system in an automatically compensated manner comprising: a reservoir supplied with heating elements for controling the temperatuare of the solution, or solvent, in the reservoir and interconnecting plumbing which connects the reservoir to a solution return line and a fluid input side of a pneumatic pump, the pump having an air inlet line connected to the air inlet side of the pump; the air inlet line being provided with an air pressure relief valve; the pump also being provided with a to process line which is connected to the fluid output side of the pump and an air outlet line which is connected to the air outlet side of the pump so that by connecting the to process line, by means of user supplied plumbing, to the fluid input side of any remote machinery, equipment, or system being cleaned, and connecting the fluid output side of the machinery, equipment, or system to the solution return line on the reservoir, by means of user supplied plumbing, and with user supplied compressed air supplied to the air inlet line, solution can be placed in the reservoir, heated to its most efficient temperature and pumped out of the reservoir, to, and thru the remote machinery, equipment or system being cleaned and back to the reservoir in a continuous and controlled manner, in which the pressure and volume of the solvent or solution is automatically compensated by the action of the air pressure relief valve, which will allow more or less air to pass through to the air inlet side of the pump to maintain a preset pressure that is established by adjusting the air pressure relief valve to the desired working pressure.

5,024,246

APPARATUS FOR PROTECTING CEILING WORK AREA FROM DISPERSAL OF ASBESTOS FIBERS

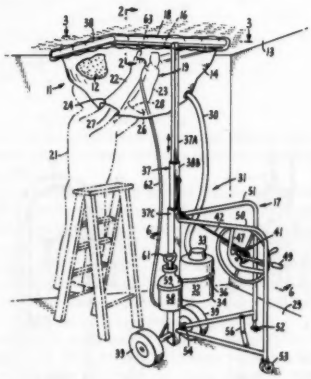
G. William Bain, 35860 Ashton, Fremont, Calif. 94536

Continuation of Ser. No. 337,140, Apr. 12, 1989, Pat. No. 4,911,191. This application Jan. 9, 1990, Ser. No. 462,599

The portion of the term of this patent subsequent to Mar. 27, 2007, has been disclaimed.

Int. Cl.[5] B08B *7/04*

U.S. Cl. 134—200 **4 Claims**



1. A containment for asbestos fibers and the like floating in the air adjacent to a ceiling as a consequence of removing or repairing materials on or near the ceiling, comprising

a substantially fiber-tight bag of flexible material having an open top adapted for placement in a position fitting in close proximity to a ceiling in surrounding relation to the ceiling area to be worked upon;

support means formed for removably holding said bag in the desired position relative to said ceiling;

evacuation means connected to said flexible bag and formed for creating a lower than atmospheric pressure condition in said flexible bag; and

glove means of flexible material sealed to said bag and extending into the interior thereof, said glove means being adapted for receiving and protecting a hand and arm inserted into said glove means.

5,024,247

CONTROL MOTOR FOR A SERVO VALVE

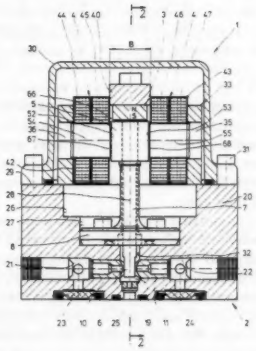
Herbert Lembke, Lohr, Fed. Rep. of Germany, assignor to Mannesmann Rexroth GmbH, Lohr, Fed. Rep. of Germany

Filed Apr. 23, 1990, Ser. No. 512,437

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1989, 3913239

Int. Cl.[5] G05D *16/20*

U.S. Cl. 137—82 **9 Claims**



1. A control motor for a servo valve, comprising, a support member (33) adapted to be mounted on a housing component (20),

at least first and second pole means (35,36) mounted at said support member (33),

control coils (4) adapted to receive a control signal and located on said pole means (35,36), an armature (5) made of a magnetically soft material and arranged in an armature space which is defined between said oppositely located first and second pole means (35,36), a resilient tube (7) having a mounting end with which the tube (7) is mounted to the housing component (20) and an opposite end which supports said armature (5),

a flapper element (6) fixedly mounted to said armature (5) and located within said tube (7) so as to extend out of said tube (7) at the tube mounting, and

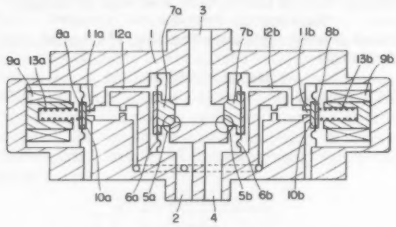
two spaced nozzles (10,11) located in said housing component, with said flapper element extending between said nozzles, such that the movement of the armature (5) leads to a movement of the flapper element towards one or the other nozzle, so as to control the fluid flow which comes out of said nozzles, a permanent magnet (3) located adjacent said armature (5) for creating a magnetic field in the armature space and the adjacent air gaps, within which said magnetic field is superimposed by the magnetic field generated by the control coils, so as to cause a reciprocal movement of the armature, and, consequently of the flapper element (6) in accordance with a control signal applied to said control coils, said support member (33) having the form of an annular body (33) and having one end surface and oppositely thereto another end surface,

a flux-conducting member (40) carrying said permanent magnet being fixedly mounted to said one end surface, and the other end surface of the annular body (33) being fixedly connected with the housing member (20) which comprises a centrally located recess for the passage of said tube.

5,024,248
TWO-POSITION AND THREE-WAY VALVE

Chikanari Kubo, Sagamihara, Japan, assignor to Eishin Technology Company, Limited, Japan

Filed Aug. 24, 1989, Ser. No. 398,147
Claims priority, application Japan, Mar. 10, 1989, 1-56218
Int. Cl.[5] F15B *13/043*
U.S. Cl. 137—596.16 1 Claim



1. A two-position and three-way valve system, comprising:

a valve body having a fluid supply port for introducing pressurized fluid thereto, a fluid inlet port and a fluid outlet port, said fluid supply and outlet ports communicating through first and second passages, respectively, with said fluid inlet port;

valve means associated with said valve body and including a pair of movable valve members mounted to said valve body, each said valve member being adapted to open or close one of said first and second passages, and each said valve member comprising a diaphragm member mounted to said valve body and a poppet valve member secured to said diaphragm member, and wherein said first and second passages each include a valve seat for receiving one of said poppet valve members to close said passage; and

actuator means associated with said valve body for actuating each of said valve members in an independent manner, said actuator means being rapidly operable in response to a control signal; said actuator means comprising a pair of electromagnetic coils and a pair of movable core members, and a nozzle flapper connected to each said core member, each said movable core member and nozzle flapper being movable in response to deenergization and energization of said coil toward and away from a nozzle to selectively close and open said nozzle;

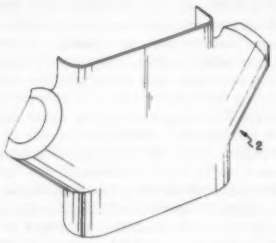
wherein each said movable core member and each said nozzle flapper are secured to an actuator diaphragm member mounted to said valve body, said actuator diaphragm member defining a portion of a flow path communicating between said nozzle and the exterior of said valve body.

5,024,249
SPECIALIZED ONE-PIECE PIPEFITTING COVER FOR INSULATED STRAINER AND LATERAL 45 DEGREE -Y

Christos J. Botsolas, Clearwater, Fla., assignor to Carol Botsolas, St. Petersburg, Fla.

Filed May 17, 1989, Ser. No. 352,871
Int. Cl.[5] F16L *59/16*
U.S. Cl. 138—110 7 Claims

1. A one-piece pipe fitting over for strainers and lateral 45° -Y fittings comprising an essentially flat base, symmetrical about a center axis, with a centrally disposed section having a top, a bottom and sides and two oppositely facing Y-sections extending from said sides, the ends of said Y-sections terminating in a flat edge, said base terminating on the sides, including the sides of the Y-sections, with edge members extending from said base in a semi-circular form to greater than 90° from the flat plane of said base, the radius of said semi-circle relating generally to the radius of the fitting about which the cover conforms, the top and bottom of said base being without said edge members, wherein said cover comprises a thermoformed plastic whereby when rotated about the center axis said cover provides a configuration essentially the same as the Y-shaped

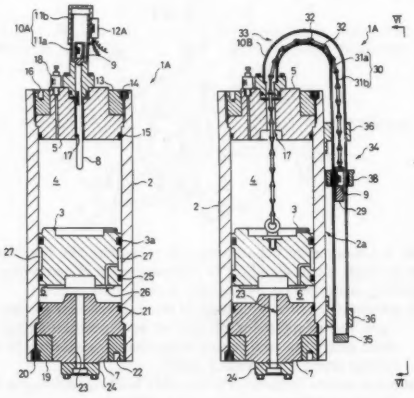


fitting with an overlap of the edge members and further comprising means for attaching the cover about said fitting.

5,024,250
PISTON TYPE ACCUMULATOR FOR HYDRAULIC SYSTEM

Masao Nakamura, Hyogo, Japan, assignor to Nakamura Koki Co., Ltd., Hyogo, Japan

Filed Jan. 9, 1990, Ser. No. 462,407
Claims priority, application Japan, Jan. 10, 1989, 1-4390
Int. Cl.[5] F16L *55/04;* F01B *25/26*
U.S. Cl. 138—31 7 Claims



1. A piston type accumulator, provided with an oil chamber bounded by a piston reciprocatingly incorporated in a cylindrical containment shell for accumulating a pressurized hydraulic fluid in a hydraulic system communicating therewith, the

accumulator also having a gas chamber precharged with pressurized gas, comprising:

a non-magnetic inductive detecting rod capable of movement in response to movement of said piston, inserted partially into said gas chamber through a guide hole of the containment shell;

a non-magnetic inductive gas-tight sealed tube means fixed to the outside of the containment shell for sealingly covering the range of movement of an end of said detecting rod, said sealed tube means communicating with said gas chamber;

a permanent magnet carried by said detecting rod, mounted on said end thereof;

a detecting switch means installed on said tube means to be actuated by a magnetic force of the permanent magnet brought close thereto in response to a movement of the piston due to an accumulation of said hydraulic fluid in the oil chamber.

5,024,251

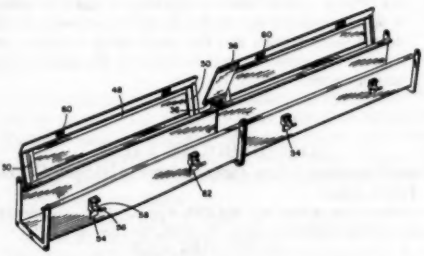
LAY-IN WIREWAY ASSEMBLY

Donald L. Chapman, Liberty, Ind., assignor to Square D Company, Palatine, Ill.

Continuation of Ser. No. 465,582, Jan. 18, 1990, abandoned, which is a continuation of Ser. No. 220,913, Jul. 19, 1988, abandoned, which is a continuation of Ser. No. 096,802, Sep. 10, 1987, abandoned, which is a continuation of Ser. No. 752,864, Jul. 8, 1985, abandoned. This application Jul. 3, 1990, Ser. No. 547,425

Int. Cl.[5] **F16L** *09/22;* **H02G** *03/04, 03/06*

U.S. Cl. 138—92 **12 Claims**



1. A lay-in wireway, comprising:

a pair of wireway sections connected end to end to form a junction, the wireway sections each having a corresponding open side;

a joint connector adapted to rest on the open sides of the wireway sections adjacent the junction between the two wireway sections when said joint connector is in a closed position;

first gasket means, carried underneath said joint connector and positioned between said joint connector and each of said wireway sections, for resiliently sealing between said joint connector and said wireway sections;

a pair of covers, each one of which is hingedly connected to a respective one of said wireway sections, said covers being movable between an open position wherein said open sides of said wireway sections are uncovered and a closed position wherein said covers overlie said joint connector and cover said open sides of said wireway sections;

second gasket means, positioned between each of said covers and said joint connector where said covers overlie said joint connector, for resiliently sealing between said covers and said joint connector;

latch means, operably associated with each of said covers, for latching said covers in their said closed positions and for compressing said first and second gasket means on opposite sides of said joint connector; and

a floating pivot means for pivotally connecting said joint connector to at least one of said wireway sections so that said joint connector can pivot relative to said wireway sections between its said closed position and an open position, and for allowing said joint connector to float between said covers and said wireway sections as said covers are moved to their said closed positions so that a substantially uniform sealing pressure is provided between said first gasket means and said wireway sections;

wherein said floating pivot means includes an elongated slot disposed in said joint connector, and a pivot pin attached to said pair of wireway sections, said elongated slot having a longer dimension oriented generally perpendicular to said open sides of said wireway sections, and said pin being received in said slot so that said pin defines a pivotal axis generally parallel to a length of said wireway sections and so that said joint connector is slidable along said longer dimension of said slot relative to said pin;

wherein adjacent ends of said wireway sections at said junction each include an outwardly extending flange; and

wherein said pivot pin is defined as a pivot pin portion of an elongated fastener extending between said flanges to connect said wireway sections, said pivot pin portion being an enlarged diameter portion of said fastener extending out from one of said flanges away from the other of said flanges.

5,024,252

HOSES STABLE IN LENGTH UNDER THE EFFECT OF AN INTERNAL PRESSURE

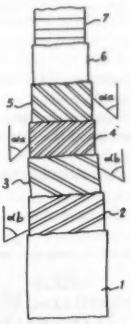
Richard Ochsner, Rosny-Sous-Bois, France, assignor to Coflexip, Paris, France

Filed Jul. 28, 1988, Ser. No. 225,120

Claims priority, application France, Aug. 3, 1987, 87 10997

Int. Cl.[5] **F16L** *11/16*

U.S. Cl. 138—130 **9 Claims**



1. A hose comprising:

an internal leak tightness sheath,

an external protective sheath, and

an armoring between said sheaths,

said armoring comprising at least two pairs of layers of helically wound wires, each of said pair of layers comprising first and second layers made up of identical wires laid at the same helix angle, but in opposite helical directions, wherein all the wires are laid at one of two helix angles, one less than 55° (α_a) and the other greater than 550° (α_a), the wires of at least one of said pairs of layers exhibiting the same helix angle α_a such that

$$40° \leqq \alpha_a \leqq 53°$$

and the wires of at least one other pair of layers exhibiting the same helix angle α_a such that

$$57° \leqq \alpha_a 70° \text{ ''},$$

said layers being arranged to satisfy the relation

$$0.5 < \frac{Rp}{Rpo} < 2$$

where:

$$Rp = \frac{\sum_{i=1}^{i=n_a} \frac{(k_a)_i}{(\phi' a)_i}}{\sum_{j=n_b}^{j=n_b} \frac{(k_b)_j}{(\phi' b)_j}}$$

and

$$Rpo = \frac{\frac{2 \sin^2 \alpha_b \cos^2 \alpha_b - \sin^4 \alpha_b}{Di \qquad Dmb}}{\frac{\sin^4 \alpha_a - 2 \sin^2 \alpha_a \cos^2 \alpha_a}{Dma \qquad Di}}$$

where:

n_a is the number of pair of layers wound at angle α_a,

n_b is the number of pair of layers wound at angle α_b,

(k_a); and (k_b), respectively are the rigidity at axial elongation of the wires of each of the pairs of armoring layers i and j, respectively, wound at angles α_a and α_b, respectively,

k being defined by $k = T / \epsilon$, where T is the tension of the corresponding wire and $\epsilon$is the relative elongation of the wire,

(l'a), and (;'b), respectively are the average value of the width occupied by the wires, i.e., the width of the wire measured in the cross section of the wire, and in a plane tangent to the cylinder produced by the armoring layer, increased by the play between two successive wires, this width being determined by the formula

$$\phi' k = \frac{\pi D_k \cos \alpha_k}{N_k}$$

where

D_k is the average diameter of the layer of wires,

α_k is the sheathing angle, and

N_k is the number of sheathing wires;

Di is the inside diameter of the first layer of interior sheathing wires;

Dma is the average diameter of n_a pairs of sheathed layers at angle α_a; and

Dmb is the average diameter of n_b pairs of sheathed layers at angle α_b.

5,024,253

SYSTEM FOR CONTROLLING WARP TAKE UP AND LET OFF RATES

Susumu Kawabata; Kazunori Yoshida; Yoshikatsu Kisanuki; Hajime Suzuki, and Masao Shiraki, all of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi and Kabushiki Kaisha Toyoda Jidoshokki, Kariya, both of, Japan

Filed Dec. 28, 1989, Ser. No. 458,406

Claims priority, application Japan, Dec. 28, 1988, 63-334047

Int. Cl.[5] D03D *49/10, 49/20*

U.S. Cl. 139—99 **9 Claims**

1. A system for controlling take-up and let-off rates or warp feed on a loom, having different weaving conditions, by taking the displacement of a cloth fell position into account when weaving conditions of the loom are changed; comprising;

a device for setting the weaving conditions of the loom;

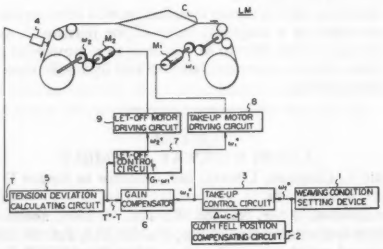
a cloth fell position compensation circuit for issuing a cloth fell compensation signal for compensating a displacement of the cloth fell position caused by a change of at least one of the weaving conditions;

a take-up control circuit for forming a take-up rate control signal for controlling a rotational rate of a take-up motor for driving a take-up roller of the loom with reference to the weaving conditions and the cloth fell position compensation signal and for outputting the take-up control signal;

a tension detector for detecting a warp tension;

an arithmetic circuit for comparing a detected warp tension with a target warp tension and outputting a deviation therebetween;

a gain compensation circuit for outputting a gain compensation signal obtained by multiplication of the take-up rate control signal modified by the cloth fell compensation signal with a gain corresponding to the deviation between the detected warp tension and the target warp tension; and



a let-off control circuit for outputting a let-off rate control signal for controlling a rotational rate of a let-off motor for driving a let-off beam, comprising an adder for adding a signal proportional to the deviation between the detected warp tension and the target warp tension to the take-up rate control signal modified by the gain compensation circuit.

5,024,254

LIQUID SHUT-OFF VALVE

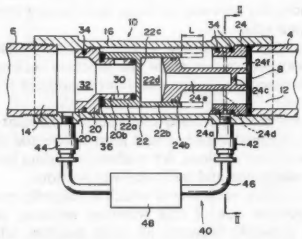
Tamio Yamagiwa, Tokyo, Japan, assignor to Hi-Sonic Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 344,088, Apr. 27, 1989, abandoned.

This application Dec. 27, 1989, Ser. No. 453,029

Int. Cl.[5] F16K *31/38*

U.S. Cl. 137—219 **1 Claim**



1. A liquid shut-off valve comprising:

a first shut-off valve unit which includes

a hollow cylindrical casing providing a liquid passage having at its one end a liquid inlet and at its other end a liquid outlet,

a hollow valve seat member disposed in the liquid passage in the casing adjacent to the liquid outlet and having a valve seat opening for allowing a liquid to pass therethrough,

a guide member disposed in the liquid passage in the casing adjacent to the liquid inlet and having a guide portion, an opening for allowing the liquid to pass therethrough at a given flow rate and a small hole, smaller than the opening,

for allowing the liquid as a signal liquid to flow therethrough at a flow rate smaller the given flow rate, and

a hollow valve member slidable along the hollow valve seat member and guide portion of the guide member for defining a pressure chamber between the hollow valve member and the guide portion and communicating with the small hole whereby the signal liquid flows into the pressure chamber, the hollow valve member including means operating free of any mechanical biasing forces for selectively opening and closing the valve seat opening;

a communication pipe providing a communication between the pressure chamber and a portion of the liquid passage downstream of the hollow valve seat member; and

shut-off valve means for selectively relieving the signal liquid from the pressure chamber;

the hollow valve member further including a partition wall substantially dividing the hollow valve member into upstream and downstream parts with the upstream and downstream part being constructed so as to include axial end surfaces with the axial end surface of the downstream part being larger than the axial end surface of the upstream part whereby the hollow valve member is capable of movement, free of any mechanical biasing forces, between a position in which the axial end surface of the upstream part abuts the guide portion and a position in which the axial end surface of the downstream part abuts the hollow valve seat member by selectively relieving the signal liquid from the pressure chamber.

5,024,255

METHOD OF FILLING A LIQUID CRYSTAL DEVICE WITH FERROELECTRIC LIQUID CRYSTAL MATERIAL

Toshio Watanabe; Masahiko Sato; Akio Osabe, all of Atsugi; Hiroyuki Sakayori, Souka, and Akira Mase, Atsugi, all of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

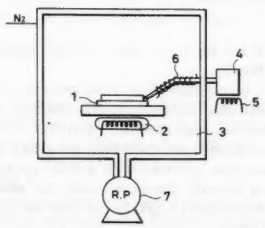
Filed Jul. 21, 1988, Ser. No. 222,636

Claims priority, application Japan, Jul. 27, 1987, 62-188442

The portion of the term of this patent subsequent to May 8, 2007, has been disclaimed.

Int. Cl.[5] G09F *9/00, 1/13, 1/00;* **B67D** *5/37*

U.S. Cl. 141—11 **1 Claim**



1. A method of filling a liquid crystal device with a blended ferroelectric liquid crystal material comprising the step of disposing said blended ferroelectric liquid crystal material in an inner space formed in said liquid crystal device, wherein the temperature of said blended liquid crystal is maintained during the disposing step higher than the transition temperature of any constituents of said blended liquid crystal material so that the blended liquid crystal material is transformed in its isotropic phase.

5,024,256

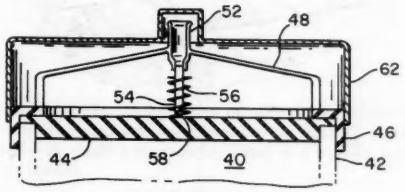
VIAL CONSTRUCTION AND METHOD

Dinesh L. Vadher, 48 Rte. 25A-Suite 303, Smithtown, N.Y. 11787

Filed Apr. 2, 1990, Ser. No. 502,711

Int. Cl.[5] B65B *1/04;* **A61B** *19/00*

U.S. Cl. 141—329 **1 Claim**



1. A self-sealing closure for an open mouth vial comprising:

a. a vial assembly including a vial with an open mouth defining a rim and having closure means of penetratable, self-sealing material mounted on, extending into and closing said mouth for sealing the contents of said vial;

b. collar means forming an annular ring mounted on the rim of said open mouth for enclosing the edge of and supporting said closure means;

c. means mounted on said collar means above said closure means outside of the mouth of said vial for supporting a needle having a pointed end directed toward said closure means and permitting axial movement of said needle comprising a vertically extending hollow tube having integral therewith a narrow member spanning and joining said annular ring forming a resilient structure permitting vertical movement of said hollow tube, said needle joined at the top thereof to and communicating with the bottom of said hollow tube, said needle having a pointed bottom facing said closure means;

d. means for biasing said needle means away from said closure means comprising a spring wrapped around said needle extending between the top of said closure means and the bottom of said hollow tube;

e. adaptor means mounted on the top of said hollow tube for attachment to and permitting communication with syringe means for receiving the contents of said vial and to depress said needle overcoming said bias to penetrate said closure means to gain access to the contents of said vial through said needle, the removal of said syringe means permitting said needle to retract from said closure means thereby resealing the contents of said vial, said closure means, collar means and mounted means including said needle forming an integral, non-removable part of said vial assembly; and

f. dust cover means covering the top of said vial assembly including said collar means, mounted means, biasing means, and said adaptor means forming a vial assembly containing its own means for removing its contents.

5,024,257

WOODWORKING MACHINE

James E. Lloyd, Rte. #1, Tremont, Ill. 61568

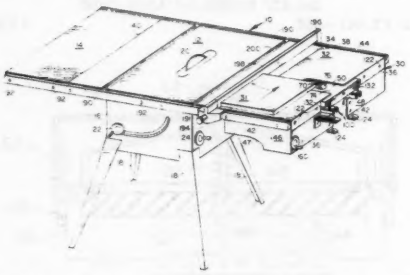
Filed Apr. 18, 1990, Ser. No. 492,755

Int. Cl.[5] B27C *9/00*

U.S. Cl. 144—1 R **23 Claims**

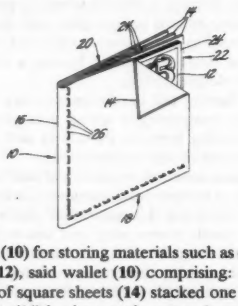
1. A woodworking machine for use with a motorized tool of the type having an axially projecting cutter, said machine comprising a relatively fixed table having an elongate opening extending transversely relative to and through one edge of said table, means for releasably supporting said tool beneath said table with said cutter projecting through said elongate opening, means for moving said tool horizontally beneath said table in a direction effective to shift said cutter longitudinally along

and selectively position said cutter within said opening, and means movable longitudinally of said opening between various selective positions spaced from said cutter for engaging one



edge of a work piece and restraining said work piece against backlash and vibration upon operational engagement between another edge of said work piece and said cutter.

5,024,258
WALLET
William C. Morehead, 10341 Southwind Dr., Cincinnati, Ohio 45242
Continuation-in-part of Ser. No. 409,007, Sep. 18, 1989, abandoned. This application Mar. 6, 1990, Ser. No. 489,964
Int. Cl.[5] A45C *1/06, 11/18*
U.S. Cl. 150—140 **6 Claims**



1. A wallet (10) for storing materials such as credit cards and money bills (12), said wallet (10) comprising:

a plurality of square sheets (14) stacked one upon the other; said sheets (14) having equal areas and coextensive peripheries defining first and second pairs of adjacent and perpendicular edges (16, 18 and 20, 22) of equal length, said wallet (10) characterized by

binding means (26) for binding said first pair of adjacent and perpendicular edges (16, 18) of all of said plurality of square sheets (14) for providing said square wallet (10) with open pockets (24) defined only by said second pair of adjacent and perpendicular edges (20, 22) for receiving materials (12) to be stored between every two of said square sheets (14).

5,024,259
GOLF CLUB RAIN SACK
C. Arthur Treadway, P.O. Box 1736, Greenville, S.C. 29607
Filed Dec. 8, 1989, Ser. No. 447,835
Int. Cl.[5] A63B *55/00*
U.S. Cl. 150—159 **10 Claims**

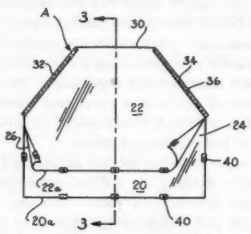
1. A protective hood for golf clubs carried in a golf bag, said bag being of the type having a handle carried on a back side of said bag, wherein said protective hood comprises:

a hood including a front panel and a back panel;

said front panel having an upper edge and terminating in a lower free edge;

said back panel having an upper edge and terminating in a lower free edge;

means for joining said upper edges of said front and back panels together to form said hood;

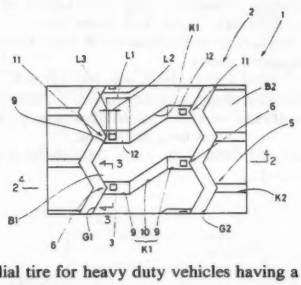


a first split vent carried on a first side of said hood between said front and back panels defined by a non-closeable opening;

a second split vent carried on a second side of said hood between said front and back panels defined by a non-closeable opening; and

weight means carried by said lower free edges of said front and back panels.

5,024,260
RADIAL TIRE FOR HEAVY DUTY VEHICLES
Kiyoshi Ochiai, Kobe, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Jul. 3, 1989, Ser. No. 374,870
Claims priority, application Japan, Jul. 9, 1988, 63-171125
Int. Cl.[5] B60C *11/08*
U.S. Cl. 152—209 R **22 Claims**



1. A radial tire for heavy duty vehicles having a tread provided with blocks,

the blocks being defined by main grooves extending in the circumferential direction of the tire and lateral grooves extending between the main grooves,

each lateral groove provided between a main portion thereof and said main grooves with a deep portion one end of which is directly connected with the main groove, and which has a depth DO1 deeper than the depth DO of the main portion,

the deep portion being provided with a platform protruding from the base thereof near the main groove,

the ratio DO/DG of the depth DO of the lateral groove main portion to the depth DG of the main groove being more than 0.7 and less than 1.0,

the ratio DO1/DG of the depth DO1 of the deep portion to the depth DG of the main groove being more than 0.8 and less than 1.0,

the ratio D1/DO1 of the height D1 of the platform to the

depth DO1 of the deep portion being more than 0.4 and less than 1.0,

the ratio W1/WO of the top width W1 of the platform to the open width WO of the lateral groove being more than 0.3 and less than 0.65 in the widthwise direction of the lateral groove, and

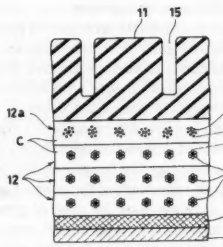
the ratio L2/L1 of the top length L2 of the platform to the length L1 of the deep portion being more than 0.2 and less than 0.7 in the longitudinal direction of the lateral groove.

5,024,261

HEAVY DUTY PNEUMATIC RADIAL TIRE WITH IMPROVED STEEL CORD BELT

Eiji Igarashi; Susumu Imamiya, and Yasuo Suzuki, all of Hiratsuka, Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 124,204, Nov. 23, 1987, abandoned. This application Nov. 1, 1989, Ser. No. 430,026
Claims priority, application Japan, Nov. 25, 1986, 61-278805
Int. Cl.[5] B60C *9/18, 9/20, 9/00*
U.S. Cl. 152—527 **4 Claims**



1. A heavy duty pneumatic radial tire including between a tread and at least one carcass layer comprising carcass cords arranged substantially perpendicular to the circumferential direction of the tire, at least two belt layers comprising steel cords including a least a pair of belt layers disposed adjacent to each other with steel cords in one layer crossing those in the other layer, wherein an outermost belt layer disposed most closely to the tread out of all belt layers comprises a steel cord which has a cord structure of 2+7 made of an element wire having a carbon content of 0.77 to 0.92% by weight and a diameter d of 0.28 to 0.40 mm and which has a tenacity at break of $(1700 \sim 2050)d^{1.872}$ (kgf/cord) and an elongation characteristic having a ratio of an elongation at break ϵ to an initial stage elongated, ϵ/P.L.E., of at least 30, and a coat rubber having a 50% modulus of 10 to 40 kg/cm^2, and wherein said outermost belt layer has a thickness of at least 1.67 times the minor diameter but at greatest 1.79 times the major diameter, of said steel cord.

5,024,262

COMPACTLY FOLDABLE AUTOMOBILE SUNSHADE

En L. Huang, 1280 Price St., Pomona, Calif. 91767

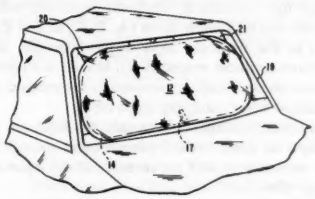
Filed Oct. 13, 1989, Ser. No. 420,936
Int. Cl.[5] B60J *3/00*
U.S. Cl. 160—370.2 **14 Claims**

1. An automobile window sunshade comprising:

a sheet of at least one layer of a flexible first material, said sheet having front and back surfaces, with at least one of said surfaces including a material suitable for reflecting light and heat radiation; and

a single closed loop of a strip of a spring-like second material secured to said sheet throughout an entire perimeter thereof;

wherein said sunshade can be (1) deployed in a first, open configuration, said singular closed loop being continuously deformable to a predetermined contour of said automobile window, and, (2) twisted to form at least a pair of sections, said sections being foldable in layered fashion to form a second, compact configuration for storage; and



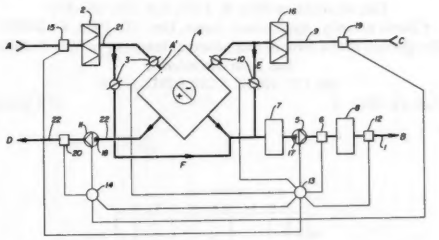
wherein restoring spring forces of said spring-like second material of said strip makes possible the retention of said sunshade inside a surrounding frame of a window in an automobile.

5,024,263

METHOD AND APPARATUS FOR THE CONTROL OF AIR FLOWS AND PRESSURES IN AIR-CONDITIONING

Juhani Laine; Mikko Nyman, both of Helsinki, and Tapio Paananen, Lohja, all of Finland, assignors to Ilmatera OY, Kauniainen, Finland

PCT No. PCT/FI88/00199, § 371 Date Sep. 18, 1989, § 102(e) Date Sep. 18, 1989, PCT Pub. No. WO89/05947, PCT Pub. Date Jun. 29, 1989
PCT Filed Dec. 16, 1988, Ser. No. 382,706
Claims priority, application Finland, Dec. 18, 1987, 875613
Int. Cl.[5] F24F *11/02, 11/04;* **F24D** *5/00*
U.S. Cl. 165—1 **16 Claims**



1. In an air-conditioning system having:

a heat recovery exchanger;

fresh-air, input-air, exhaust-air, waste-air and return-air ducts coupled to the heat recovery exchanger;

a fresh-air bypass duct for bypassing the heat exchanger from the fresh-air duct to the input-air duct;

a power controllable input-air fan;

a power controllable waste-air fan;

closing and control mechanisms for the fresh air duct and the fresh-air bypass duct coupled to each other as an intake-air mechanism

closing and control mechanisms for the exhaust air duct and the return air duct coupled to each other as an outlet-air mechanism said return-air duct interconnecting said exhaust-air duct and said input-air duct;

wherein each of the intake- and outlet-air mechanisms have first and second interconnected control damper devices for controlling air flows in the two ducts, respectively, associated with the air mechanism;

wherein each control damper device is moveable from a first closed position to a second closed position through an open position; and

wherein the first and second control damper devices of at least one of the air mechanisms are opened out of phase with respect to each other such that the first control damper device is opened from a closed position when the

second control damper device is opened from the first closed position and is beginning to move towards the second closed position;

a method for controlling fresh-air, input-air, exhaust-air, waste-air and return-air flows (A, B, C, D and E, respectively) in the fresh-air, input-air, exhaust-air, waste-air, and return-air ducts, respectively, as well as air pressure in the input-air duct and air pressure in the exhaust-air duct, the method comprising the steps of:

measuring, substantially continuously, the fresh-air, input-air and waste-air flows in the fresh-air, input-air and waste-air ducts, respectively, and the pressure of the input-air in the input-air duct; and

upon any one of the fresh-air flow, input-air flow, waste-air flow and input-air pressure measurements deviating from respective preset values, regulating the outlet-air mechanism and the intake-air mechanism to adjust to and maintain substantially at a predetermined constant at least one of the difference (A-D) between the fresh-air flow and the waste-air flow and their ratio (A/D).

5,024,264

METHOD OF COOLING A SEMICONDUCTOR DEVICE WITH A COOLING UNIT, USING METAL SHERBET BETWEEN THE DEVICE AND THE COOLING UNIT

Katsuhide Natori, Yokohama; Isao Watanabe, Sagamihara; Koji Katsuyama, Yokohama; Isao Kawamura, Yokohama; Karuhiko Yamamoto, Yokohama, and Takeshi Nagai, Yokohama, all of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Continuation-in-part of Ser. No. 334,770, Apr. 10, 1989, which is a continuation of Ser. No. 106,842, Oct. 13, 1987, abandoned.

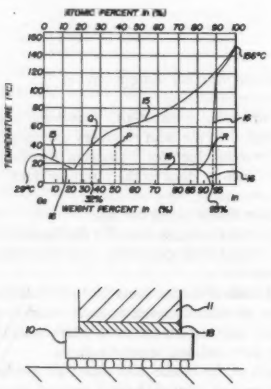
This application May 8, 1989, Ser. No. 348,370

Claims priority, application Japan, Oct. 20, 1986, 61-248801

The portion of the term of this patent subsequent to May 7, 2008, has been disclaimed.

Int. Cl.[5] H05K *7/20;* **F28D** *21/00*

U.S. Cl. 165—1 **15 Claims**



1. In a method for cooling a substance to be cooled, by using heat transfer means, the improvement comprising the use of a heat conducting body being in a two-phase state of liquid and solid uniformly throughout the body at a temperature of said substance and disposed between said substance and the heat transfer means, said heat conducting body having a coefficient of viscosity greater then 3,000 centipoise at the operating temperature of said substance.

5,024,265

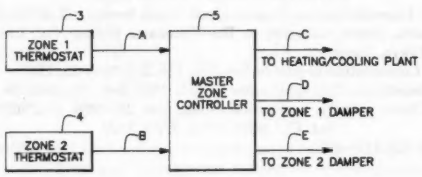
ZONE CONTROL SYSTEM PROVIDING SYNCHRONIZATION OF SYSTEM OPERATION WITH THE ZONE OF GREATEST DEMAND

Robert L. Buchholz, Eden Prairie; Eric W. Grald, Maple Plain; Lorne W. Nelson, Bloomington, and Dipak J. Shah, Eden Prairie, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 18, 1989, Ser. No. 451,705

Int. Cl.[5] F24F *7/00*

U.S. Cl. 165—22 **22 Claims**



1. A zone control system comprising

a plurality of zone thermostats arranged to produce respective on/off output signals corresponding to the temperature induced demands of their respective zones,

a plurality of zone control devices with each of said device controlling a respective one of the zones,

zone controller means for determining a zone of greatest temperature induced demand distinct from a zone of lesser demand, for converting the length of the on-periods of said output signals representing the zone of lesser demand relative to the duty cycle of the zone of greatest demand and for synchronizing the start of the converted signals representing the zone of lesser demand with the start of the control signal for the zone of greatest demand and

means for applying the synchronized start signals to respective ones of said zone control devices.

5,024,266

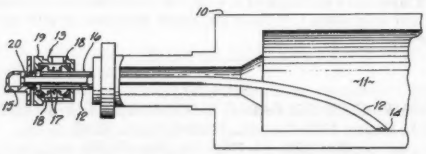
HEATED ROLL

Graham Critchlow, Cheadle Hulme, England, assignor to Simon Container Machinery Limited, Stockport, England

Filed Jul. 13, 1990, Ser. No. 552,076

Int. Cl.[5] F28D *11/02;* **F26B** *11/04*

U.S. Cl. 165—89 **4 Claims**



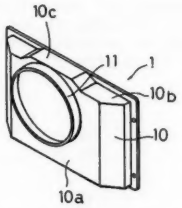
1. A heated roll comprising a hollow cylindrical shell defining an internal chamber into which steam may be fed, a syphon pipe fixed within said chamber and having one open end near to the lowermost position therein, the pipe having a part of its length substantially concentric with the roll and located within a rotary sealed joint outside of the chamber for drainage of condensate therefrom, said pipe being fixed to a non-rotating part of the rotary joint; characterized in that said non-rotating part is mounted with a clearance fit on a pair of fixed guide bars; and in that a plurality of jacking screws are operable between said non-rotating part and said guide bars to adjust the position of the non-rotating part and thus the pipe relative to the rotational axis of the roll.

5,024,267

COOLING APPARATUS FOR HEAT EXCHANGER

Shigeru Yamaguchi, Toyota, and Ken-ichiro Mizutani, Kariya, both of Japan, assignors to Aisin Kako Kabushiki Kaisha, Aichi and Aisin Seiki Kabushiki Kaisha, Kariya, both of Japan

Filed Jun. 14, 1990, Ser. No. 537,619
Claims priority, application Japan, Jun. 28, 1989, 1-76016[U]
Int. Cl.[5] F28F *13/12;* F01P *7/10*
U.S. Cl. 165—122 7 Claims



3. A cooling apparatus for a heat exchanger comprising:

a shroud comprising a box-shaped main body disposed in a manner covering one of the surfaces of a heat exchanger, and a cylindrical portion disposed in a manner penetrating through said main body, wherein the axis of said cylindrical portion is disposed substantially perpendicular to the bottom surface of said main body and part of said cylindrical portion is protruded with respect to the outline of said heat exchanger; and

a fan disposed in said cylindrical portion of said shroud;

wherein said main body comprises an enlarged portion disposed adjacent to and corresponding to said protruding part of said cylindrical portion, and said bottom surface of said main body extends substantially from the entire periphery of the end portion of said cylindrical portion,

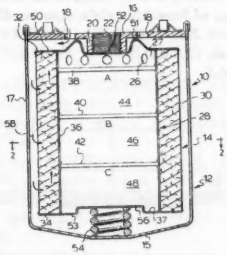
wherein the top of said enlarged portion is at least flush with the top of said protruding part of said cylindrical portion.

5,024,268

CORROSION INHIBITING COOLANT INHIBITOR CONTAINER

Brian E. Cheadle, Bramalea, and Richard J. Rusiniak, Richmond Hill, both of Canada, assignors to Long Manufacturing Ltd., Oakville, Canada

Continuation-in-part of Ser. No. 226,828, Aug. 1, 1988, abandoned, which is a division of Ser. No. 50,777, May 18, 1987, Pat. No. 4,782,891. This application Nov. 14, 1989, Ser. No. 436,916
Claims priority, application Canada, Dec. 23, 1986, 526256
Int. Cl.[5] F28F *19/00*
U.S. Cl. 165—134.1 6 Claims



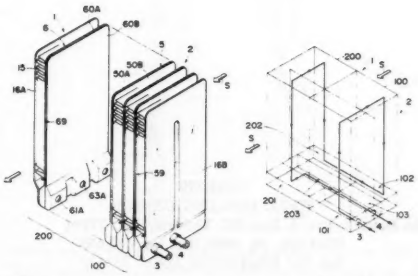
1. A container for the addition of corrosion inhibitor to the cooling system of an engine, comprising: a container member having a closed end and a tubular wall with a metallic inner surface; a partition member and extending between opposed sides of said tubular wall spaced from said closed end to define a compartment for a dosage of corrosion inhibitor material, the partition member having a peripheral edge portion being formed of metallic material anodic to the tubular wall inner surface; and the tubular wall being compressed into tight engagement with the partition member forming a fluid tight galvanic couple therebetween.

5,024,269

LAMINATED HEAT EXCHANGER

Ichiro Noguchi, and Futoshi Nakata, both of Konan, Japan, assignors to Zexel Corporation, Tokyo, Japan

Filed Aug. 24, 1990, Ser. No. 573,060
Claims priority, application Japan, Aug. 24, 1989, 1-98942; Nov. 30, 1989, 1-310910
Int. Cl.[5] F28D *1/03*
U.S. Cl. 165—153 16 Claims



1. A laminated heat exchanger comprising:

a plurality of first heat exchanger elements, each said first heat exchanger element including a pair of first and second tanks, a first U-shaped channel interconnecting said first and second tanks, and a central third tank disposed between said first and second tanks and separated from said first and second tanks;

a plurality of second heat exchanger elements, each said second heat exchanger element including a pair of fourth and fifth tanks, a second U-shaped channel interconnecting said fourth and fifth tanks, and a central sixth tank disposed between said fourth and fifth tanks and communicating with one of said fourth and fifth tanks; and

a plurality of corrugated fins;

said first heat exchanger elements and a part of said plural corrugated fins being laminated alternately, with said first tanks, second tanks and third tanks of each adjacent pair of the laminated first heat exchanger elements communicating with each other, said laminated first heat exchanger elements having a first internal refrigerant flow passage extending between said first and second tanks and having a forward path and a return path;

said second heat exchanger elements and the remainder of

said corrugated fins being laminated alternately, with said fourth tanks, fifth tanks and sixth tanks of each adjacent pair of the laminated second heat exchanger elements communicating with each other, said laminated second heat exchanger elements having a second internal refrigerant flow passage extending between said fourth and fifth tanks and having a forward path and a return path;

said laminated first heat exchanger elements and said laminated second heat exchanger elements being connected end to end, with said third tank of an endmost one of the laminated first heat exchanger elements communicating with said sixth tank of a confronting one of the laminated second heat exchanger elements so that said third and sixth tanks jointly forming a group of central tanks connected in series;

one of said first and second tanks of said endmost first heat exchanger element communicating with the other of said fourth and fifth tanks of said confronting second heat exchanger element to connect said first and second internal refrigerant flow passages in series to thereby form a combined refrigerant flow passage having two forward paths and two return paths, said combined refrigerant flow passage being connected at one end with an end of said group of series-connected central tanks.

5,024,270

WELL SEALING DEVICE

John Bostick, Rte. 5, Box 307, Victoria, Tex. 77901

Filed Sep. 26, 1989, Ser. No. 412,655
Int. Cl.[5] E21B *23/04, 23/06, 33/129*
U.S. Cl. 166—63 **6 Claims**

1. A well sealing device comprising:

a cable head for attachment to a wire line;

an upper housing releasably attached to the cable head;

a pressure cylinder slidably mounted within the upper housing;

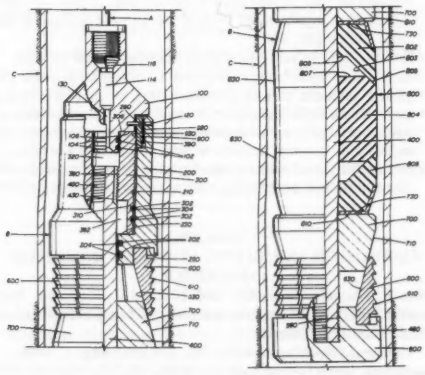
pressurizing means for creating an increased pressure within the pressure cylinder to cause the pressure cylinder to move relative to the upper housing and to cause the cable head to move relative to the upper housing;

a longitudinal mandrel attached at its upper end to the pressure cylinder;

a lower housing attached to the lower end of the mandrel;

expandable slip means slidably mounted on the mandrel between the upper housing and the lower housing for outward expansion upon vertical compression to set the slip means against a well casing; and

a releasing means connected to the cable head and the upper housing for releasably attaching the cable head to the upper housing, the releasing means responsive to the relative movement between the upper housing and the cable head developed as a result of the pressurizing means causing movement of the pressure cylinder to release the cable head from the upper housing prior to partial setting of the slip means also developed as a result of the pressurizing means causing movement of the pressure cylinder and as a result the mandrel.

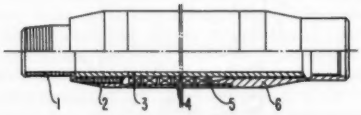


5,024,271

PERMANENT-MAGNET WAX-PROOF DEVICE

Wang Meihua, Baotou, China, assignor to Baotou Institute of Applied Design of New Materials, Baotou, China

Filed Jan. 9, 1989, Ser. No. 294,818
Int. Cl.[5] E21B *37/00;* **F17D** *1/08*
U.S. Cl. 166—66.5 **15 Claims**



13. A permanent-magnet wax-proof device for magnetically treating crude oil streams to enhance their flow properties and to reduce their tendency to deposit paraffin on the interior surface of a conduit or pipe carrying said crude oil and to which the device is connected, said device comprising one or

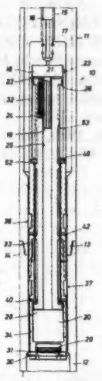
more pairs of magnetic pole pairs each provided with two magnetic circuit units, each such unit comprising radially oriented magnets cooperating with at least one of axially and circumferentially oriented magnets to produce a high concentration of magnetic field in the flowing oil so as effectively to decrease the oil viscosity and suppress the process of wax accumulation upon the walls of the conduit or pipe.

5,024,272

DRILL PIPE DOWNHOLE UNTHREADING APPARATUS

Dennis E. Roessler, Houston, Tex., assignor to Halliburton Logging Services, Inc., Houston, Tex.

Filed May 7, 1990, Ser. No. 520,324
Int. Cl.[5] E21B *31/20*
U.S. Cl. 166—117.7 **13 Claims**



1. Apparatus for unthreading a threaded connection in a drill string, the apparatus comprising:

(a) an elongate shaft;

(b) fluid powered means for moving said shaft in repeated movement between first and second positions:

(c) upper and lower mandrels supporting said shaft and exposed to joints making up the drill string, said mandrels joining together to permit rotation therebetween;

(d) upper and lower pipe gripping means cooperatively engaging pipe joints in the drill string wherein said upper pipe gripping means engages a pipe joint above a threaded connection in the pipe string and said lower pipe gripping means engages a pipe joint below the threaded connection in the pipe string; and

(e) means coupling said shaft to impart repeated movement through said upper and lower mandrels and pipe gripping means to the pipe joints so that the threaded connection in the pipe string is rotated to unthread.

5,024,273

CEMENTING APPARATUS AND METHOD

Malcolm G. Coone, Katy; Jeffry C. Ehlinger, Houston, and Frank Cole, Sugarland, all of Tex., assignors to Davis-Lynch, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 415,670, Oct. 2, 1989, abandoned. This application Apr. 4, 1990, Ser. No. 504,337
Claims priority, application Canada, Sep. 29, 1989, 614995
Int. Cl.[5] E21B *33/14, 34/10*
U.S. Cl. 166—289 **24 Claims**

1. Apparatus for use in placing cement at a desired location within the annulus between a casing string and a well bore, comprising

a body having a bore therethrough which is connectible as part of the casing string for lowering therewith into the well bore and a port connecting its bore with its outer side,

a packing element including an inflatable sleeve surrounding the body below the port,

said body having passageway means therein connecting its bore with a space between the sleeve and body,

a tubular member having a bore therethrough with an upwardly facing seat thereabout and passageway means therein connecting its bore with its outer side,

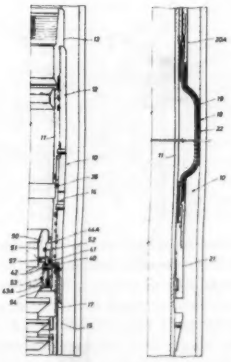
said member being disposed within the bore of the body for vertical reciprocation between an upper position in which it closes the port in the body and its passageway means connects with the passageway means in the body and a lower position in which it opens said port and closes the passageway means in each of the member and body,

shear means releasably connecting the tubular member to the body in its upper position,

a plug lowerable through the casing string into a landed position on the seat in the member,

said plug having port means therethrough and being sealably engageable with the bore of the member, when landed on the seat, to connect the port means and thus the casing string thereabove with the passageway means in the member,

said member having means thereon for closing its passageway means but adapted to be moved to open position by



the plug, as the plug is landed, whereby pressure fluid in the casing string above the plug may be supplied to the space in order to inflate and expand the sleeve of the packing element into engagement with the well bore beneath the port and then shear the releasable connection of the member to the body and move the member to its lower position in which cement may be circulated through the open port in the body and into the annulus above the inflated sleeve, and

means on the member and body for locating and holding the member in the lower position.

22. In a method of placing a column of cement at a desired location between a casing string and a well bore by means of a stage collar comprising a body having a bore therethrough connected to a pipe string, a sleeve reciprocable within the bore between an upper position in which it is releasably connected to the body to close a port in the body connecting its bore with its outer side and a lower position in which it opens the port to permit cement to be circulated therethrough, a plug lowerable through the pipe string and onto the sleeve to permit pressure fluid in the string above the plug to release the connection and lower the sleeve to its lower position, and an inflatable packer element mounted on the body beneath the port with its interior connectable to the bore of the body by normally closed passageway means, the steps of

lowering the stage collar body with the pipe string to dis-

pose the packing element beneath the desired location within the well bore,

lowering the plug onto the sleeve to open the passageway means,

supplying fluid pressure to the pipe string above the plug and through the passageway means in order to inflate the packing element, and

raising the level of fluid pressure in the pipe string above the plug in order to release the sleeve from its connection to the body and move it with the plug to its lower position opening the port as well as closing the passageway means in order to contain pressure fluid therein and prevent the introduction of additional pressure fluid to the inflated packing element.

5,024,274

METHOD AND APPARATUS FOR ENHANCED OIL RECOVERY

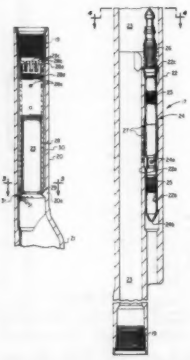
Carl M. Schwab, Jr., Bakersfield, Calif., assignor to Otis Engineering Corp., Dallas, Tex.

Continuation-in-part of Ser. No. 793,842, Nov. 1, 1985, Pat. No. 4,646,828. This application Aug. 29, 1986, Ser. No. 901,556

The portion of the term of this patent subsequent to Mar. 3, 2004, has been disclaimed.

Int. Cl.[5] E21B *43/24, 34/08, 23/03*

U.S. Cl. 166—303 **54 Claims**



1. A mandrel connectable in a conduit and having a longitudinal flow passage therethrough comprising:

(a) an upper tubular section having means therein for separating and collecting wetter steam and hot water from steam injected into said flow passage; and

(b) a lower body section having a receptacle therein offset from said flow passage, said receptacle communicating said flow passage with the mandrel exterior and ports in said lower body communicating said receptacle with said flow passage, said tubular section also including means for directing the separated and collected wetter steam and hot water to flow toward said receptacle or said flow passage through said mandrel.

33. A method of selectively providing steam or wet steam and hot water to one or more formations in an enhanced oil recovery injection well simultaneously comprising the steps of:

(a) drilling a hole through earth formations containing viscous petroleum deposits;

(b) running casing into said hole and perforating said casing at selected intervals adjacent each said formation;

(c) running one or more tubing strings into said casing having a selected mandrel or selected spaced apart mandrels and a packer therein above each mandrel, each said mandrel having means therein for separating and collecting wetter steam and water from steam injected into said tubing string and directing said collected steam and water exterior of or through each said mandrel; and

(d) operating said packers to seal above and between each formation and provide separate sealed tubing casing annular regions exterior of each of said mandrels, each said region communicating through a perforated interval with a formation.

5,024,275

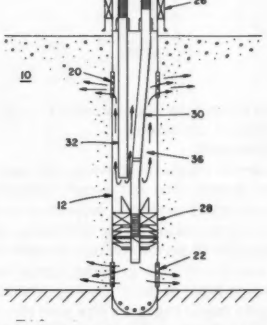
METHOD OF RECOVERING HYDROCARBONS USING SINGLE WELL INJECTION/PRODUCTION SYSTEM

Donald J. Anderson, Newport Beach; John H. Duerksen, Fullerton, both of Calif.; Doug J. McCallum, and Mark Petrick, both of Calgary, Canada, assignors to Chevron Research Company, San Francisco, Calif.

Filed Dec. 8, 1989, Ser. No. 447,733

Int. Cl.[5] E21B *43/24*

U.S. Cl. 166—303 **12 Claims**



1. A method for enhancing the recovery of viscous hydrocarbons from a subterranean formation wherein said formation is traversed by a cased wellbore having a first tubing string, a first packer and a second tubing string, a second packer combination therein, said wellbore casing having a thermal communication path lying contiguous with the formation when a drive fluid is injected down said second tubing string and accesses a thermal zone parenthetically defined by said packers, said thermal communication path directing produced fluids from the formation to said first tubing string for recovery, the improvement comprising:

flowing said drive fluid down both said first and said second tubing string to expedite heating of said wellbore casing;

maintaining drive fluid flow down both the first and the second tubing string until said thermal communication path is established and the viscosity of at least a portion of the viscous hydrocarbons in said formation near the wellbore casing is reduced for direction along said thermal communication path;

reversing the flow within the first tubing string to produce said hydrocarbons from the formation to the surface as said hydrocarbons traverse the thermal communication path adjacent said wellbore casing.

5,024,276

HYDRAULIC FRACTURING IN SUBTERRANEAN FORMATIONS

John K. Borchardt, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Nov. 28, 1989, Ser. No. 442,265
Int. Cl.[5] E21B *43/267*
U.S. Cl. 166—308 22 Claims

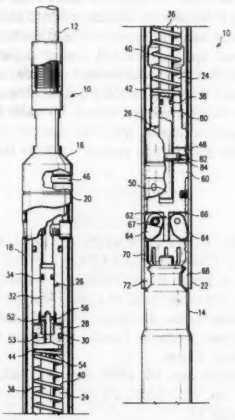
1. A process for the hydraulic fracturing of subterranean formations which comprises a step for the introduction into the formation at fracturing pressure of a fracturing fluid comprising solid particulate suspended in a fluid dispersion comprising (a) water, (b) a component selected from the group consisting of supercritical carbon dioxide and gaseous nitrogen, carbon dioxide and C_1 to C_3 hydrocarbons, and mixtures thereof, and (c) one or more polysaccharide surfactants of the formula $RO(R^1O)_xSacc_z$, wherein R is a monovalent organic radical having a carbon number in the range from about 7 to 24, R^1 represents a divalent hydrocarbon radical containing from about 2 to about 4 carbon atoms, x is a number having an average value in the range from 0 to about 12.0, and Saccz represents an average number z between about 0.7 and 10.0 of moieties derived from reducing saccharides containing 5 or 6 carbon atoms.

5,024,277

RUNNING TOOL FOR USE IN WELL BORES

Thomas D. Ricles, Kingwood, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Feb. 6, 1990, Ser. No. 475,689
Int. Cl.[5] E21B *31/18*
U.S. Cl. 166—381 23 Claims



1. A running tool for use in locating releasable apparatus in a well bore comprising:

an elongated, hollow tool body;

a fixed length mandrel slidingly disposed in said tool body and movable therein from a running position, when connected to the well apparatus, to a release position when disconnected from the well apparatus;

an outer sleeve encircling said body and having a first end extending past one end of said body;

a resilient collet member carried by said mandrel and disposed within the first end of said sleeve when said mandrel is in said running position and outside said sleeve when said mandrel is in said release position;

a sealed chamber of fixed volume in said body;

a substantially incompressible fluid substantially filling said chamber;

a flange on said mandrel located in said chamber, said flange carrying a seal in sliding and sealing engagement with said body; and

a metering passageway in said mandrel providing restricted fluid flow from one side of said seal to the other as said mandrel moves therein, thereby determining the time required to move said mandrel between said positions.

18. A method for positioning apparatus in a well bore comprising the steps of:

extending a running tool with the apparatus releasably connected thereto to the desired location in the well bore;

compensating for the weight of the tool being lowered;

exerting a substantially constant tensile force on the tool for a predetermined time of not less than thirty seconds until the apparatus releases from the tool; and

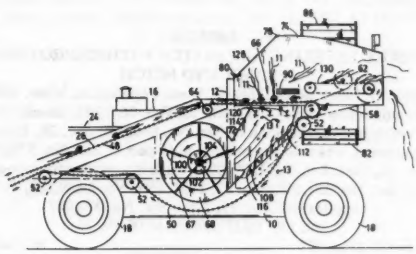
withdrawing the disconnected running tool.

5,024,278

HARVESTING MACHINE HAVING BLOWER DAMAGE PREVENTION MEANS

Lee N. Shuknecht, Elba, N.Y., assignor to Lee Shuknecht & Sons, Inc., Elba, N.Y.

Filed Feb. 9, 1990, Ser. No. 479,141
Int. Cl.[5] A01D *23/04, 33/02*
U.S. Cl. 171—17 26 Claims



23. In a harvester for a crop being harvested accompanied by debris, such as rocks and soil clumps, which passes from one side to the other side of a region in said harvester, said harvester having a blower, the improvement comprising an air flow apparatus for processing said crop which comprises a duct having sides which define said region and said sides of said region, said blower being deposed spaced from said sides and being in air communicating relationship with said duct, said duct having passageway below said region through which said debris falls.

5,024,279

FOLDABLE IMPLEMENT CARRIER

Steven D. Warner, Naperville, and John F. Stufflebeam, Romeoville, both of Ill., assignors to J.I. Case Corporation, Racine, Wis.

Filed Feb. 20, 1990, Ser. No. 481,271
Int. Cl.[5] A01B *73/06*
U.S. Cl. 172—1 19 Claims

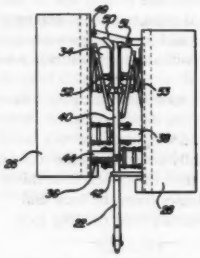
15. A method of folding a foldable implement carrier comprising a frame and two opposed tool sections pivotally attached to the frame, the tool sections each having a wheel at a laterally outer portion, a main wheel set supporting the frame, comprising the steps of:

(1) forcing the main wheel set and the wheels on each tool section vertically downwardly, thus forcing the frame and the tool sections vertically upwardly;

(2) pivoting the tool sections about pivot axes on the frame to move the tool sections to a folded position;

(3) raising the wheels at the end of the tool sections vertically off of the ground, thus lowering latch members

which are mounted to the tool sections vertically downwardly onto an upper surface of the frame, and continuing



to raise the wheels until they abut a lower surface of the frame.

5,024,280

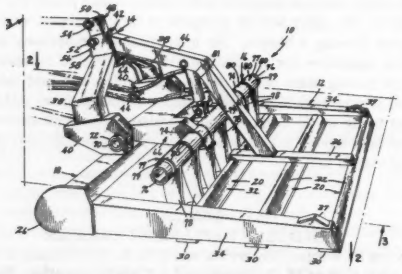
SOIL LEVELING APPARATUS WITH IMPROVED FRAME AND HITCH

Orlan H. Mork, 6029 225th St. West, Farmington, Minn. 55024

Continuation of Ser. No. 163,178, Feb. 26, 1988, abandoned, which is a continuation of Ser. No. 856,818, Apr. 28, 1986, abandoned, which is a continuation-in-part of Ser. No. 570,347, Jan. 13, 1984, Pat. No. 4,585,075, which is a continuation-in-part of Ser. No. 224,458, Jan. 12, 1981, Pat. No. 4,448,258. This application Jun. 27, 1989, Ser. No. 372,027

Int. Cl.[5] **E02F** *3/815;* **A01B** *49/02*

U.S. Cl. 172—197 **55 Claims**



1. An apparatus for leveling soil and the like, comprising:

a frame including a plurality of transverse elongate ground engaging members fixedly secured together in a mutually spaced apart relationship;

the ground engaging members of said frame being of inverted generally V-shaped cross section having an apex with downwardly diverging front and rear walls of different inclinations extending downwardly from the apex, and wherein the front wall is more steeply inclined than the rear wall, wherein the front and rear walls extend downwardly from the apex and terminate in lower edges which are substantially coplanar with one another in a substantially horizontal plane and which are in egagement with the ground when the frame is laid flat on the ground; and

hitch means carried on the frame for connecting the frame to a vehicle.

5,024,281

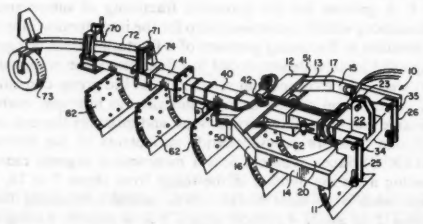
REVERSIBLE MOLDBOARD PLOW

Thomas D. Furlough, Tarboro, N.C., assignor to Long Manufacturing N.C., Inc., Tarboro, N.C.

Filed Aug. 2, 1990, Ser. No. 562,026

Int. Cl.[5] **A01B** *3/40*

U.S. Cl. 172—219 **12 Claims**



8. A reversible moldboard plow, comprising a generally planar frame having front and rear cross members, first and second lower hitch means carried by the front cross member, a longitudinal beam, means pivotally mounting said beam approximately centrally of said rear cross member for swinging movement in substantially the plane of the frame, moldboards mounted transversely of said beam in longitudinal spaced relation and depending beneath it for plowing the ground, and hydraulic cylinder and piston means mounted on said rear cross member beside said longitudinal beam and substantially in the plane thereof, said cylinder and piston means mounted for swinging movement in spaced relation from said beam, said cylinder and piston means pivotally connected to said beam forwardly of said rear cross member, whereby operation of the cylinder and piston means causes the beam to swing from side to side in order to change the angle of said moldboards with respect to the direction of travel, and first and second spaced bracket means depending from said front cross member, first and second cylinder and piston means mounted on said first and second bracket means, said first and second lower hitch means carried by said first and second cylinder and piston means, whereby operation of said first and second cylinder and piston means controls the angle of tilt of said frame.

5,024,282

ELECTRONIC POSTAL RATING SCALE OPERABLE IN METRIC AND AVOIRDUPOIS WEIGHT UNITS

Terry E. Raikes, Santa Rosa; William L. Kramer, Windsor; John B. Howard, Forestville, all of Calif.; Wayne D. Moore, North York, Canada; Louis Jackson, Milford, and Jeffrey D. Kotecki, Newtown, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Jan. 16, 1990, Ser. No. 465,675

Int. Cl.[5] **G01G** *19/40;* **G06F** *15/20*

U.S. Cl. 177—25.15 **15 Claims**

1. A postal scale comprising:

(a) weighing means for supplying a signal representative of the weight of an item;

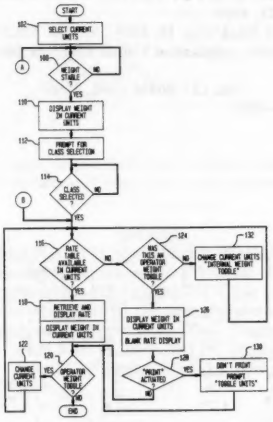
(b) weight selecting means for selecting a current system of weights from a predetermined plurality of systems of weights;

(c) class selecting means for selecting a desired class of service from a predetermined plurality of classes of service;

(d) rate table memory means for storing a plurality of rate tables, said memory means storing at least one rate table for each of said classes of service, said plurality of rate tables comprising at least one rate table defined in a first of said systems of weights, said plurality of rate tables comprising at least one other rate table defined in a second of said systems of weights; and

(e) calculating means, responsive to said weighing means,

said weight selecting means and said class selecting means, for calculating a postal rate for said item as a function of the weight of said item and in accordance with said desired class of service; said calculating means accessing said

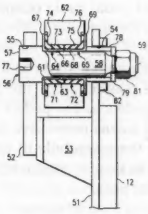


at least one rate table if said current system is said first system of weights; said calculating means accessing said at least one other table if said current system is said second system of weights.

5,024,283
PIVOTABLE, RESILIENT MOUNTING

Jack M. Deli, Winfield, Ill., assignor to Komatsu Dresser Company, Libertyville, Ill.

Filed Feb. 6, 1990, Ser. No. 475,819
Int. Cl.[5] B62D *33/067*
U.S. Cl. 180—89.14 **24 Claims**



1. In an apparatus comprising a body frame, a tiltable element, and a plurality of devices for pivotably mounting said tiltable element to said body frame, the improvement wherein each of said devices comprises:

first and second spaced apart, generally parallel bracket members secured to a first one of said body frame and said tiltable element, a support element secured to the second one of said body frame and said tiltable element, said support element having a first opening extending therethrough, a second opening located in said first bracket member in coaxial alignment with a third opening located in said second bracket member and with said first opening in said support element,

a generally cylindrical shaft positioned in said first, second and third openings, said shaft having first and second shaft end sections and an intermediate shaft section therebetween, the diameter of said first shaft end section being greater than the diameter of said intermediate shaft section so as to form a first shoulder therebetween, each of said first and second shaft end sections having external threads thereon, said first bracket member having internal threads in said second opening to matingly receive the threads on said first shaft end section,

an annular shell having an inner diameter at least as large as the diameter of said intermediate shaft section and less than the diameter of said first shaft end section,

an annular resilient sleeve mounted circumferentially about said annular shell and in contact with said annular shell and said support element,

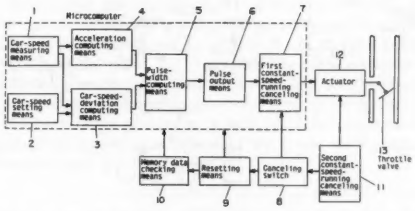
an annular spacer sleeve positioned coaxially with said shaft and extending through said third opening with the outer diameter of said spacer sleeve being slightly less than the diameter of said third opening, and

an internally threaded retention element engaged with the threads on said second shaft end section to fixedly position said annular shell and said spacer sleeve between said first shoulder and said retention element.

5,024,284
APPARATUS FOR RUNNING A CAR AT CONSTANT SPEED

Shigeru Nakano, Daitou, and Yasuhiro Kondou, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co. Ltd., Kadoma, Japan

Filed May 31, 1989, Ser. No. 384,206
Continuation of PCT JP88/00756, Jul. 28, 1988, abandoned.
Claims priority, application Japan, Jul. 31, 1987, 62-192921
Int. Cl.[5] B60K *31/04*
U.S. Cl. 180—179 **2 Claims**



1. An apparatus for running a car at a constant speed, said apparatus comparing a desired speed with an actual running speed and controlling an opening of a throttle valve to equalize said actual running speed and said desired speed, said apparatus comprising:

car-speed measuring means for measuring said actual running speed of the car;

car-speed setting means for setting the desired speed of the car;

car-speed-deviation computing means for computing a deviation between said desired speed and said actual running speed;

acceleration computing means for computing an acceleration as a change in said actual running speed of the car;

pulse-width computing means for calculating a pulse width as a function of both said car-speed deviation computed by said car-speed deviation computing means and said acceleration computed by said acceleration computing means;

pulse output means for issuing a pulse signal having said pulse-width computed by said pulse-width computing means and having a predetermined period;

a microcomputer including first constant-speed-running canceling means disposed within the microcomputer for canceling a state of constant-speed running by receiving a signal of a canceling switch;

second constant-speed-running canceling means disposed outside said microcomputer for also canceling the state of constant-speed-running by receiving the signal of the canceling switch; and

an actuator which adjusts the opening of the throttle valve during the predetermined period in accordance with the

pulse width of the pulse signals of said pulse output means, only when the constant-speed-running is not canceled.

5,024,285

SLIPPAGE PREVENTING APPARATUS FOR A VEHICLE

Nagahisa Fujita, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

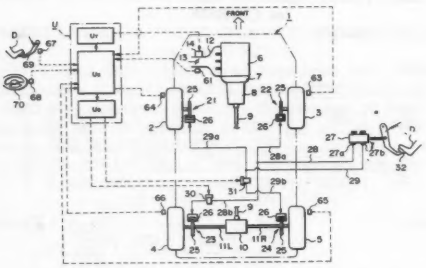
Filed Jul. 26, 1988, Ser. No. 224,372

Claims priority, application Japan, Jul. 30, 1987, 62-188827

The portion of the term of this patent subsequent to Oct. 25, 2005, has been disclaimed.

Int. Cl.[5] B60K *31/00*

U.S. Cl. 180—197 **22 Claims**



1. A slippage preventing apparatus for a vehicle with one pair of either front or rear wheels being driven and the other pair being undriven, comprising:

driven wheel rotational speed detecting means for detecting a rotational speed of the driven wheel;

undriven wheel rotational speed detecting means for detecting a rotational speed of the undriven wheel;

cornering radius difference detecting means for detecting a difference in cornering radius between the driven wheel and the undriven wheel;

torque adjusting means for adjusting a torque to be applied to the driven wheel by increasing or decreasing the torque;

slip amount detecting means for detecting a slip amount or an amount of slippage of the driven wheel on a surface on the basis of the difference between the rotational speed of the driven wheel detected by said driven wheel rotational speed detecting means and the rotational speed of the undriven wheel detected by said undriven wheel rotational speed detecting means;

slip amount controlling means for controlling the amount of slippage by increasing or decreasing the torque applied to the driven wheel by said torque adjusting means so as to reach a target slip amount; and

correction means for correcting a control amount to be provided to said slip amount controlling means so as to compensate for deviations in detected slip amount resulting from the difference in cornering radius between the front and rear wheels detected by said cornering radius difference detecting means.

5,024,286

MOTOR ASSISTED PEDAL CYCLE

Gordon D. Lean, and Anthony H. K. Dennis, both of Church Lane, The Old Coach House, Fenny Compton, Great Britain

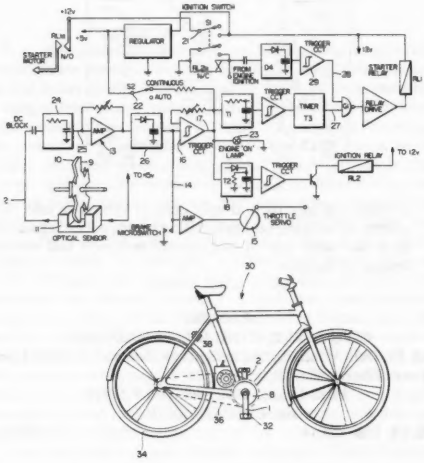
PCT No. PCT/GB89/00263, § 371 Date Jan. 16, 1990, § 102(e) Date Jan. 16, 1990, PCT Pub. No. WO89/08579, PCT Pub. Date Sep. 21, 1989

PCT Filed Mar. 14, 1989, Ser. No. 435,373

Claims priority, application United Kingdom, Mar. 14, 1988, 8806042

Int. Cl.[5] B62M *7/00, 23/02*

U.S. Cl. 180—206 **17 Claims**



1. An engine assisted pedal cycle comprising: a pair of foot operated rotary pedals for applying a driving torque of varying magnitude to a wheel of the cycle; an engine for applying a driving torque of varying magnitude to a wheel of the cycle; means for sensing the magnitude of the torque produced by foot pressure on the pedals as the pedals are rotated to drive the cycle; and control means responsive to the torque sensing means for controlling the magnitude of the torque applied by the engine in response to the magnitude of the torque produced by foot pressure on the pedals.

5,024,287

ENGINE UNIT FOR VEHICLE

Kaoru Okui, and Manabu Kobayashi, both of Iwata, Japan, assignors to Yamaha Hatsudiki Kabushiki Kaisha, Iwata, Japan

Filed Nov. 14, 1988, Ser. No. 270,357

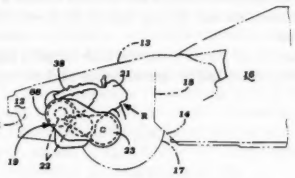
Claims priority, application Japan, Mar. 31, 1987, 63-78535; Dec. 1, 1987, 62-301542; Dec. 1, 1987, 62-301543

Int. Cl.[5] F16H *57/02*

U.S. Cl. 180—297 **40 Claims**

1. In a motor vehicle having a driven wheel rotating about a first axis that extends generally transversely to the vehicle, an engine supported within said vehicle, with its output shaft rotating about a second axis that extends generally parallel to said first axis, said first axis being disposed on one side of said second axis, the improvement comprising a transmission having a primary shaft rotatable about a third axis generally paral-

lel to said second axis and on the other side thereof from said first axis, means for driving said transmission primary shaft



from said engine output shaft, and means including said transmission for driving said wheel from said primary shaft.

5,024,288

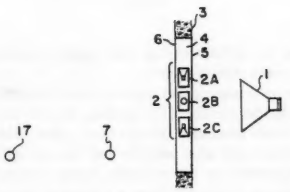
SOUND ATTENUATION APPARATUS

Kevin P. Shepherd, Yorktown, and Ferdinand M. W. A. Grosveld, Hampton, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 10, 1989, Ser. No. 392,165

Int. Cl.[5] E04B *1/82*; F01N *1/06*

U.S. Cl. 181—206 **8 Claims**



1. A sound barrier comprising:

a multiple wall partition positioned between a primary acoustic source producing a first sound of a frequency and a zone wherein the sound of said primary acoustic source is to be attenuated;

a sound-transmitting medium within said partition; and

at least one secondary acoustic source positioned to generate a second sound within the partition, the second sound having a frequency, magnitude, and phase selected so as to achieve attenuation in said zone.

5,024,289

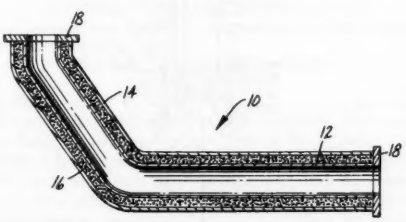
INSULATED DOUBLE-WALLED EXHAUST PIPE

Richard P. Merry, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 14, 1989, Ser. No. 407,401

Int. Cl.[5] F01N *3/02*, *3/06*

U.S. Cl. 181—231 **5 Claims**



1. An improved double-walled exhaust pipe including an inner pipe, an outer pipe surrounding the inner pipe to produce a uniform annular gap therebetween, and an annular flange attached to each end of the inner and outer pipes, wherein the improvement comprises:

filling the annular gap between the inner pipe, the outer pipe and the annular flanges with low-density, high-temperature resistant, inorganic, fired, hollow, ceramic spheroids comprising

A. a continuous phase made of a material selected from the group consisting of aluminum phosphate, sodium silicate ($Na_2Ox_1SiO_2$) in which x_1 is the molar ratio of SiO_2 to Na_2O and is between about 2.75 and 3.65 and potassium silicate ($K_2Ox_2SiO_2$) in which x_2 is the molar ratio of SiO_2 to K_2O and is between about 2.5 and 4; and

B. an insolubilizing agent, selected from the group consisting of kaolin clay, iron oxide, titanium dioxide, alumina trihydrate an zinc oxide, which combines with the continuous phase during firing to make the continuous phase insoluble in water;

said hollow, ceramic spheroids having a cellular shell, in which the shell material contains a multiplicity of irregular, nonspherical, hollow cells.

5,024,290

SOUND ABSORBING PANEL FOR INTERIOR WALLS

Otto Birker, K nacht, Switzerland, assignor to Lignoform Benken AG, Benken, Switzerland

Filed Mar. 16, 1990, Ser. No. 494,285

Claims priority, application Switzerland, Mar. 17, 1989, 993/89

Int. Cl.[5] E04B *1/82*

U.S. Cl. 181—293 **12 Claims**

1. A sound absorbing panel for architectural styling, with several sound absorbing and piercing holes, wherein several grooves are incorporated in approximately parallel, opposite surfaces of the panel, the grooves of one surface intersecting with the grooves of the other surface, and said intersecting grooves having groove depths which form a sum greater than a thickness of the panel so as to form said holes at the intersections of the grooves, and wherein the grooves are V-shaped or funnel-shaped in cross-section.

5,024,291

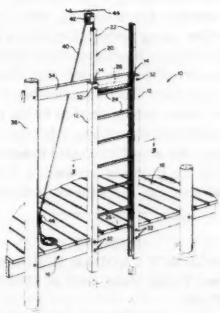
LADDER ASSEMBLY

Thomas W. Price, 30524 River Rd., Orange Beach, Ala. 36561

Filed Oct. 30, 1989, Ser. No. 428,899

Int. Cl.[5] E06C *9/08*

U.S. Cl. 182—85 **6 Claims**



1. A ladder assembly for attachment to a wharf or pier comprising:

a pair of elongated frame members, each frame member

having a channel extending the length of the frame member;

a ladder member mounted in said channels for movement along the length of said frame members, said ladder member including a pair of vertical side members interconnected by a plurality of rungs; and

a flat plate member attached to and extending from one of said rungs in a plane generally perpendicular to said side members, said ladder member being mounted in said channels for free movement along the length of said channels, and with said ladder member being of a material having sufficient weight and density so that said ladder member will fall into the water surrounding said wharf or pier until said plate member contacts said wharf or pier.

5,024,292

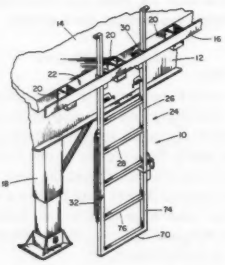
PORTABLE LADDER ASSEMBLY FOR TRUCK TRAILERS

John R. Gilbreath, and Bobbie L. Gilbreath, both of Pasadena, Tex., assignors to Bobbie Scope, Inc., Brownsville, Tex.

Continuation-in-part of Ser. No. 300,373, Jan. 23, 1989, abandoned. This application Nov. 2, 1989, Ser. No. 430,882

Int. Cl.[5] E06C *5/00*

U.S. Cl. 182—90 **24 Claims**



24. A portable ladder assembly adapted to be removably mounted in a space between a body and a rail spaced therefrom, comprising:

a main ladder section having an elongated member and a plurality of step members transversely secured thereto;

means disposed adjacent a top end of said elongated member for removably securing an upper end of said main ladder section between the rail and the body with said main ladder section depending from the rail;

an extension member for extending above the rail, said extension member being retractable below the rail; and

a lower ladder section having at least one transverse step member supported by at least one elongated member attached to said main ladder section adjacent a lower end thereof, said lower ladder section being repositionable to at least two different elevations, wherein said lower ladder section is hingedly attached to said lower end of said main ladder section for pivoting between a lowered, operative position. and a raised, inoperative position.

5,024,293

EMERGENCY LADDER EQUIPMENT

Anthony Yang, and Victor Yang, both of 1594 Travois Cir., Las Vegas, Nev. 89119

Filed Jan. 8, 1990, Ser. No. 462,179

Int. Cl.[5] E06C *9/06*

U.S. Cl. 182—93 **3 Claims**

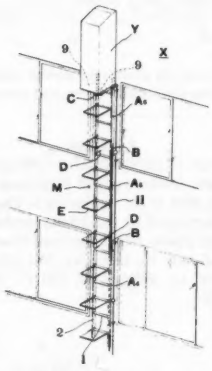
1. Emergency ladder equipment comprising;

(a) a plurality of ladder members which form a complete ladder by being vertically suspended one after another,

(b) a storage case storing said ladder members under a stacked condition, said storage case mounted on an uppermost portion of an outside wall of a building,

(c) a plurality of ladder connecting devices each of which connects perpendicularly the bottom end of a preceeding ladder member and the top end of the lower ladder member, and

(d) a plurality of support stays which support the bottom of said respective ladder members in said storage case and



release the bottom end of each ladder member by a suitable means release means,

whereby by releasing said support stays from the bottom end of the ladder members and making the first ladder member slide down from said storage case, other ladder members slide down one after another and said all ladder members are suspended in series while being connected by said connecting devices to form a complete ladder.

5,024,294

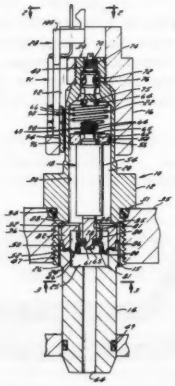
DIFFERENTIAL PRESSURE TRANSDUCER

Robert A. Van Fossen, Auburn, Ind.; Scott L. Spence, Port Washington, Wis., and Donald E. DeWitt, Syracuse, Ind., assignors to Johnson Service Company, Milwaukee, Wis.

Filed Jun. 7, 1990, Ser. No. 534,457

Int. Cl.[5] F01M *11/10*

U.S. Cl. 184—108 **14 Claims**



1. A differential pressure sensing device for monitoring the pressure differential between the discharge pressure and the

crankcase pressure of a lubricating pump for a compressor, said device comprising:

a housing having a high pressure chamber,

a nozzle mounted on said housing and having a low pressure chamber,

a diaphragm separating said high pressure chamber from said low pressure chamber,

a tension spring mounted in said high pressure chamber,

a magnet carrier assembly connecting said spring to said diaphragm, means in said device for connecting said high pressure chamber to the discharge side of said lubricating oil pump, means in said device for connecting said low pressure chamber to the crankcase, and

means mounted in said housing for sensing the axial position of said magnet carrier assembly.

5,024,295

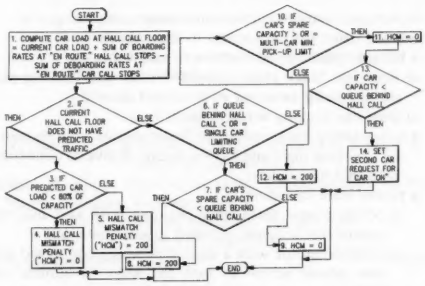
RELATIVE SYSTEM RESPONSE ELEVATOR DISPATCHER SYSTEM USING ARTIFICIAL INTELLIGENCE TO VARY BONUSES AND PENALTIES

Kandasamy Thangavelu, Avon, Conn., assignor to Otis Elevator Company, Farmington, Conn.

Continuation-in-part of Ser. No. 209,744, Jun. 21, 1988, Pat. No. 4,838,384. This application Mar. 3, 1989, Ser. No. 318,307

Int. Cl.[5] B66B *1/18*

U.S. Cl. 187—125 **20 Claims**



1. A method of controlling the dispatching of elevator cars based on a system of bonuses and penalties, said penalties including a car load penalty for penalizing the stopping of a relatively loaded elevator car at a predetermined floor registering a hall call, said method comprising the steps of:

determining the load of the car when the car reaches the predetermined floor;

comparing said determined load to a predetermined car load limit; and

determining said car load penalty based on said comparison.

5,024,296

ELEVATOR TRAFFIC "FILTER" SEPARATING OUT SIGNIFICANT TRAFFIC DENSITY DATA

Nader Kameli, New Britain, Conn., assignor to Otis Elevator Company, Farmington, Conn.

Filed Sep. 11, 1990, Ser. No. 580,901

Int. Cl.[5] B66B *1/20*

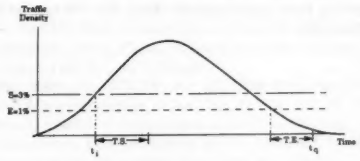
U.S. Cl. 187—132 **12 Claims**

1. An elevator subsystem for use in association with a computer based elevator system having clock timing means and a historic data base, which data base includes at least passenger traffic indicative data, such as boarding and de-boarding counts for at least the past day maintained on a time-interval-by-time-interval, sequential basis, for processing the elevator passenger traffic data for use in the elevator system, comprising:

data "filtering" signal processing means for receiving and evaluating incoming elevator passenger traffic data having

at least two, preset elevator passenger traffic values, one greater than the other, indicative of two different levels of passenger traffic, and

at least two, preset time values, a first, minimum time value based on a minimum amount of time the incoming data must continuously have values greater than said preset, greater traffic value, traffic data values fulfilling these conditions being indicative of significant traffic density in the elevator system, and a second, maximum time value based on the amount of time the incoming data remains below the lesser of said preset traffic values, after having remained above said minimum, greater traffic value for at least said minimum time value,



said data "filtering" means generating signals indicative of what part of the traffic data first exceeded said greater preset traffic value when the values of the data continued to be greater than said greater preset traffic value for at least said preset minimum time value, fulfilling a first condition, and indicative of what part of the traffic data thereafter had values below the lesser preset traffic value for a period of time exceeding said present maximum time value, said signals be usable to cause at least a substantial part of the traffic data existing in the incoming data stream for those intervals whose data fulfilled said conditions to be recorded for further use in the elevator system.

5,024,297

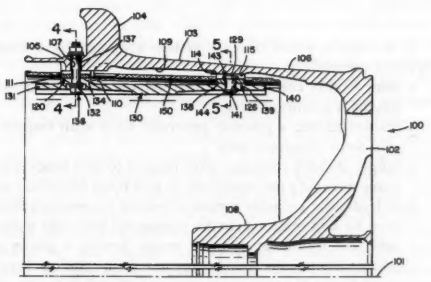
TORQUE TRANSMITTING BEAM FOR WHEEL HAVING BRAKE TORQUE DRIVES

Donald L. Russell, New Carlisle, Ohio, assignor to The B.F. Goodrich Company, Akron, Ohio

Filed May 16, 1989, Ser. No. 352,786

Int. Cl.[5] F16D *55/36, 65/12*

U.S. Cl. 188—18 A **22 Claims**



1. A rim construction for a wheel and multidisc brake assembly, the wheel including a web, the rim of said wheel being generally cylindrical and coaxial with the axis of said wheel and brake assembly, said rim having a rim flange and a chin adjacent the rim flange and a radially inner surface extending from the rim flange chin to the web of the wheel configured to mechanically support at least one torque-transmitting beam extending radially inward from and axially partially across said inner surface, said radially inner surface including adjacent the

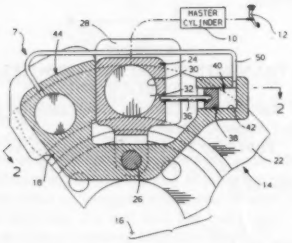
wheel rim flange chin a first boss projecting radially inwardly relative to the surrounding radially inner surface of the rim and having a recess receiving a first spacer associated with said torque beam and a bore receiving a bolt assembly securing said first spacer and torque beam to the rim, and a discretely isolated second boss projecting radially inwardly relative to the surrounding radially inner surface of the rim and axially aligned with but distal from said first boss and proximal to a wheel web member, said second boss receiving a second spacer associated with said torque beam, said second spacer and torque beam having aligned apertures receiving a substantially radially extending shear pin passing through said aligned apertures in said second spacer and torque beam but not into said rim, said pin being the primary means of transferring torque-transmitting force applied to the beam into the second boss of the wheel rim.

5,024,298

APPARATUS AND METHOD OF AUTOMOTIVE BRAKE WITH BOOSTER PISTON

Donald E. Schenk, Vandalia; Edward J. DeHoff, Huber Heights, and Schuyler S. Shaw, Dayton, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed May 17, 1989, Ser. No. 353,040
Int. Cl.[5] F16D *55/14*
U.S. Cl. 188—72.2 **16 Claims**



1. A vehicle wheel braking system activated by a master cylinder comprising:

a rotor fixably connected to said vehicle wheel, said rotor having a rotational axis;

a bracket having a position generally fixed with respect to said rotor rotational axis;

a caliper slidably mounted with respect to said bracket in a plane generally perpendicular to said rotor rotational axis;

first hydraulic cylinder means activated by pressure delivered by said master cylinder connected with said caliper, said first hydraulic cylinder means having a piston for frictionally engaging said rotor to retrain rotation thereof;

second hydraulic cylinder means positioned between said caliper and said bracket, said second hydraulic cylinder means having a piston being pressurized by a reaction force experienced between said caliper and said bracket when said first hydraulic cylinder means is activated;

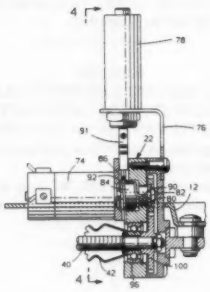
third hydraulic cylinder means fluidly connected with said second hydraulic cylinder means to receive pressure therefrom, said third hydraulic cylinder means having a piston to frictionally engage said rotor to restrain rotation thereof.

5,024,299

ELECTRIC DRUM BRAKE

Schuyler S. Shaw, Dayton; Linda L. Hallinan, Centerville, both of Ohio; Robert J. Hammersmith, Rochester Hills, Mich.; Donald E. Schenk, Vandalia, Ohio; Edward J. DeHoff, Huber Heights, Ohio, and Alexander Kade, Grosse Pointe Woods, Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 353,120, May 17, 1990. This application May 18, 1990, Ser. No. 525,386
Int. Cl.[5] F16D *65/27*
U.S. Cl. 188—156 **8 Claims**



1. An automotive vehicle drum brake comprising:

a brake drum for connection to said wheel;

a backing plate for connection to said vehicle;

at least one brake shoe connected with said backing plate and pivotally mounted with respect thereto;

at least one braking actuator including:

a non-rotative nut mounted for linear motion with respect to said backing plate and having means of pivotal connection with said brake shoe;

a power train including:

a power screw threadably engaged with said nut, said power screw being mounted to said plate; and

an electric motor with a shaft torsionally connected with said power screw to turn the same to actuate said brakes;

a drum connected with said power train;

a coil spring surrounding said drum and said spring being grounded at one end, and wherein activation of said motor in a direction to release said brake causes said drum to wind said spring and be restrained from rotation by said spring; and

an actuator operatively associated with another end of said spring for moving said spring into a position generally unwinding said spring and restraining said spring from engagement with said drum.

5,024,300

DISC BRAKE ROTOR AND WHEEL ASSEMBLY

Jon E. Miller, Spring Valley, and Donald E. Schenk, Vandalia, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed May 17, 1989, Ser. No. 353,412
Int. Cl.[5] F16D *65/853*
U.S. Cl. 188—264 CC **2 Claims**

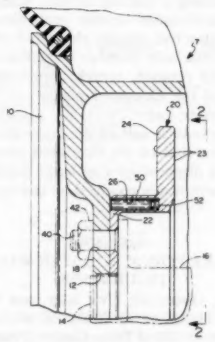
1. A vehicle wheel and rotor assembly for use with an automotive vehicle having an axle and an automotive disc-type brake having a fluid pressurized caliper with brake pads, said assembly in combination comprising;

a wheel for threaded connection with said axle via a plurality of studs;

a rotor having an annular ring section generally providing a flat surface for a friction surface for engagement with said caliper brake pads to restrain rotation of said wheel, said

rotor having a core section joined to said annular ring section and said core section having apertures aligned for threadably joining said rotor to said wheel;

heat pipe means embedded within said rotor core, said heat pipe means providing a heat sink for said annular ring section of said rotor causing a fluid within said heat pipe means to vaporize on an end of said heat pipe means more



adjacent to said annular ring section and to condense on an end of said heat pipe means more adjacent to said wheel to transfer heat from said annular ring section to said wheel for dispersement from said wheel by convection into the atmosphere;

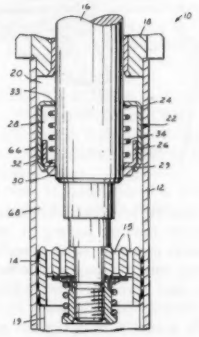
and spring means for biasing said heat pipe means into contact with said wheel.

5,024,301

HYDRAULIC REBOUND STOP ASSEMBLY FOR A SHOCK ABSORBER

Robert H. Cook, Farmington Hills, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed May 23, 1990, Ser. No. 527,629
Int. Cl.[5] F16F 9/48
U.S. Cl. 188—284 **24 Claims**



1. A hydraulic rebound stop assembly for use in a telescopic shock absorber having a working cylinder containing fluid, a piston slidably received within said working cylinder and defining a boundary for a rebound chamber within said cylinder, a piston rod connected to said piston and extending through one end of said working cylinder, closure means for closing said one end of said cylinder to define with said piston the rebound chamber and slidably mounting said piston rod, said hydraulic rebound stop assembly comprising:

a generally cylindrical, cup-shaped outer housing member slidably disposed within said working cylinder, said outer housing member including a central aperture at one end thereof for receiving said piston rod therethrough;

a generally cylindrical, cup-shaped inner housing member mounted to said piston rod and slidably disposed in said outer housing member and defining a damping chamber therebetween for receiving said fluid therein, said inner housing member including a central aperture at one thereof for receiving said piston rod therethrough;

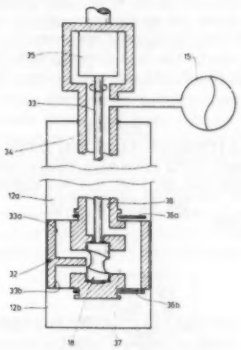
damping means operatively associated with said inner and outer housing members for creating a damping force in said shock absorber after a predetermined amount of rebound stroke of said piston within said working cylinder.

5,024,302

APPARATUS FOR DAMPING COURSES OF MOTION

Dean Karnopp, Davis, Calif., assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Division of Ser. No. 379,700, Jul. 11, 1989, Pat. No. 4,936,423, which is a continuation of Ser. No. 73,872, Jul. 15, 1987, abandoned, which is a continuation of Ser. No. 851,982, Apr. 14, 1986, abandoned. This application Apr. 4, 1990, Ser. No. 504,201
Claims priority, application Fed. Rep. of Germany, Apr. 12, 1985, 3513128; Jul. 12, 1985, 3524862
Int. Cl.[5] F16F 9/46, 9/34, 9/52
U.S. Cl. 188—299 **6 Claims**



1. An apparatus for damping courses of motion of two bodies or masses separated from each other and moving relative to one another and in their absolute positions at variable speeds, in particular for damping resilient wheel suspension systems in vehicles, road vehicles, buses, railways and the like, comprising a cylinder, a piston displaceable in said cylinder, first and second work chambers in said cylinder, said cylinder and said piston being connected to a respective one of said bodies, a single variable pressure medium damper control valve being arranged to effect a variable flow of a pressure medium to and fro between at least one work chamber of said first and second work chambers, a hydropneumatic reservoir connected relative to said control valve, a signal control means, first sensor means adapted to determine a relative speed of said two bodies relative to one another and to direct a corresponding first signal to said signal control means, second sensor means adapted to determine an absolute speed of at least one of the bodies independently of one another to thereby produce a corresponding second signal which is directed to said signal control means, said first and second signals representing a combined damping force ($F_d = B_A \cdot V + B_P V_{rel}$) having an active damping coefficient (B_A) and a passive damping coefficient (B_P) correlated to a body velocity V and a relative speed V_{rel} respectively, said variable pressure medium damper control valve including a valve opening adjusting member being configured such that said valve adjusting member rotates effec-

tively to vary fluid flow of two branch lines connected thereto in accordance with a signal received from said signal control means, one rotational direction supplying a tension stage and one rotational direction supplying a compression stage, a first fluid line that connects said first work chamber via a first flow connection to one portion of said variable pressure medium damper control valve, at least one one-way check valve connected in series with at least one of said first and second work chambers and a connection of said hydropneumatic reservoir relative to said control valve, a position of said control valve adjusting member relative to said first fluid line being controlled via said first and second sensor means and said signal control means, said valve adjusting member being adapted to assume different rotational positions relative to said first flow connection thereby providing a lesser pressure medium flow relative to a second flow connection with a simultaneous greater pressure medium flow relative to said first flow connection and vice versa to generate different flow resistance for said damping force (F_d) applied and acting in different directions and further to generate asymmetrical damping properties for a respective predetermined position of said valve adjusting member as determined by said signal control means for said valve adjusting member to enable the movement of said valve adjusting member continuously out of a maximum opening position for at least one of said compression stage and said tension stage and into an arbitrary intermediate position to thereby attain a semi-active damper system, such that whenever a combined damping force determined by said signal control means in accordance with signals from said first and second sensor means has an algebraic sign (+ or −) opposite that of the damping forces made necessary by said courses of motion of the two bodies, said damping force is substantially reduced to zero (F=0) and said vehicle has a smooth ride.

5,024,303

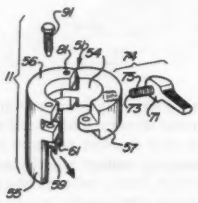
HATCHBACK LOCKING DEVICE

Ronald S. Kosloff, 15772 Luxenburg, Fraser, Mich. 48026

Filed Oct. 31, 1989, Ser. No. 428,919

Int. Cl.[5] F16F *9/32*

U.S. Cl. 188—300 **4 Claims**



1. A locking device for retaining a liftgate support of a hatchback-type door for a vehicle in an open position, the liftgate support including a housing cylinder and an elongated piston rod, the elongated piston rod being slidably positionable relative to the housing cylinder along the longitudinal axis of the elongated piston rod, an end of the elongated piston rod being received within the housing cylinder, the locking device comprising:

(a) a body member having a longitudinal axis and being generally toroidal in shape, the body member having an aperture formed therethrough through which the elongated piston rod is slidably moveable relative to the housing cylinder, the body member further comprising:

(1) a first portion having a first and second end, each end comprising a female end having an aperture disposed therethrough,

(2) a second portion having a first and second end, each end comprising a male end having an aperture formed therethrough, the apertures of each male end being matable with an associated aperture of an associated female end,

(b) a flange attached to the body member extending along the longitudinal axis of the body member;

(c) means for securing the body member onto the housing cylinder comprising two sided tape;

(d) a locking member comprising: a threaded fastener disposed normally to the longitudinal axis of the body member and including a bearing surface, wherein the bearing surface of the threaded fastener bears directly against the elongated piston rod, and the elongated piston rod in turn bears against the body member when the locking member is in a locked position, thereby precluding the slidable movement of the elongated piston rod relative to the housing cylinder; and

wherein the longitudinal axis of the body member is coaxial with the elongated axis of the elongated piston rod and the securing means is disposed on the flange proximate to where the elongated piston rod is received by the housing cylinder.

5,024,304

VACUUM BRAKE FORCE BOOSTER WITH ACOUSTIC INSULATION

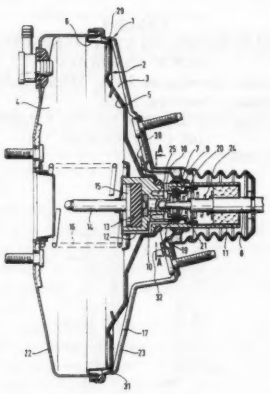
Sigmund Booten, Oberursel; Uwe Kley, and Cristiano Hoffmann, both of Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 13, 1989, Ser. No. 450,129

Claims priority, application Fed. Rep. of Germany, Jan. 9, 1989, 3900416

Int. Cl.[5] B60T *13/52*

U.S. Cl. 188—356 **23 Claims**

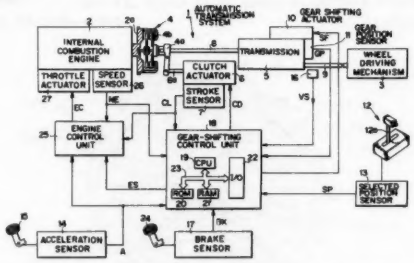


1. A vacuum brake force booster for automotive vehicles, comprising a booster housing having at least two housing sections and an axially movable partition sealingly subdividing said booster housing into a vacuum chamber and a ventable working chamber, said force booster further comprising an axially movable control valve housing including a control valve mechanically actuable by a control piston and operatively coupled to said booster housing for alternately communicating the working chamber with the vacuum chamber and the atmosphere, said axially movable control valve housing comprising, in the guiding area of the control piston, a plurality of intervals spaced from one another by radial reinforcing bridges, wherein the housing section defining the ventable working chamber and the intervals define first and second areas for support of insulating composition, respectively, and at least one of said areas is lined with an insulating composition for attenuating noise resulting from inflowing air upon actuation of said vacuum brake force booster.

5,024,305
METHOD FOR CONTROLLING VEHICLE TRANSMISSION SYSTEMS

Kazumasa Kurihara, and Tsutomu Takahashi, both of Higashimatsuyama, Japan, assignors to Zexel Corporation, Japan

Filed Jul. 16, 1990, Ser. No. 552,499
Claims priority, application Japan, Jul. 28, 1989, 1-195722
Int. Cl.[5] B60K *41/28*
U.S. Cl. 192—0.055 **7 Claims**



1. A method for electronically and automatically controlling a gear-shifting operation of a vehicle transmission system having a gear-type transmission and a clutch coupled with an internal combustion engine in response to at least the amount of the operation of an accelerator pedal and a running speed of a vehicle, said method comprising steps of:

discriminating whether or not the clutch has engaged in response to an increase in the running speed of the vehicle after the clutch is once disengaged in the case where the gear-shifting operation is carried out in a control mode wherein the clutch is disengaged so as to prevent idle running of the vehicle when a rotational speed of the engine becomes lower than a first level which is a little higher than an idling speed of the engine;

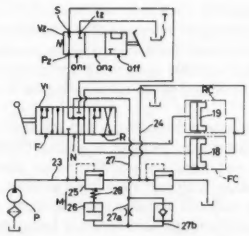
discriminating whether or not a brake pedal is depressed; and

changing the control mode to another control mode in which the engaged state of the clutch is maintained unless the rotational speed of the engine becomes lower than a second level which is a little lower than the idling speed if the brake pedal is not depressed when the clutch has engaged in response to the increase in the running speed.

5,024,306
PROPELLING DRIVE CONTROL APPARATUS FOR WORKING VEHICLE

Tetsu Fukui; Takashi Yoshii; Toshihiko Takemura, all of Sakai, and Akio Hattori, Minamikawachi, all of Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Nov. 16, 1988, Ser. No. 272,037
Int. Cl.[5] F16D *25/00*
U.S. Cl. 192—3.57 **4 Claims**



1. A propelling drive control apparatus for a working vehicle comprising:

a pump for supplying hydraulic oil to said apparatus,

hydraulically operable friction clutch means for providing a propelling drive transmission state,

first clutch control means for operating said friction clutch means,

second clutch control means connected in series to said first clutch control means and having three control positions (off, on1 and on2), wherein one of said control positions is a declutching position (off) which is established for stopping a hydraulic oil supply to said friction clutch means and for releasing hydraulic pressure oil from said friction clutch means, a second one of said control positions is a first clutch engaging position (on1) which is for supplying pressure oil supplied to said second clutch control means directly to said friction clutch means, and the third one of said control positions is a second clutch engaging position (on2) which is for stopping the hydraulic oil supply from said second clutch control means to said friction clutch means, means for releasing the hydraulic pressure oil from inside said friction clutch means in an amount corresponding to an amount of operation of a control device, and thereafter stopping release of the hydraulic pressure oil to maintain an oil pressure in said friction clutch means, and

an oil pressure adjusting mechanism including a variable relief valve and an adjusting means mounted in an oil feed passage from said pump for the first and second clutch control means,

said oil pressure adjusting mechanism being connected to the oil feed passage with the first clutch control means being in an operative position whereby relief pressure of the relief valve increases with increasing oil pressure supplied to the oil pressure adjusting mechanism,

said oil pressure adjusting mechanism being connected to a return tank with the first clutch control means being in a neutral position whereby the relief pressure of the relief valve decreases to a lowest level, wherein

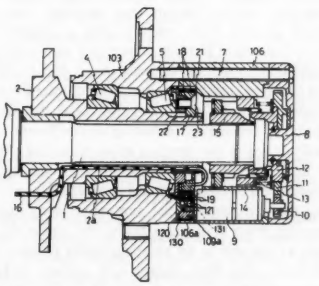
said second clutch control means is disposed adjacent said friction clutch means and is supplied with hydraulic pressure oil from said first clutch control means,

and said oil pressure adjusting mechanism cancels the hydraulic oil pressure for engaging said friction clutch means in response to a declutching operation of said first clutch control means and returns to an initial state.

5,024,307
FREE WHEEL HUB SYSTEM

Hideaki Wakabayashi, Nagoya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Dec. 26, 1989, Ser. No. 456,379
Claims priority, application Japan, Dec. 28, 1988, 63-168420[U]
Int. Cl.[5] B60K *23/08;* F16D *41/00*
U.S. Cl. 192—40 **8 Claims**



1. A free wheel hub system, comprising:

drive means carrying first electrical contact means,

an axle hub rotatably mounted on said drive means by bearing means,

a hub body attachable to said axle hub, and

a free wheel hub mechanism connected within said hub body for selectively drivably interconnecting said drive means and said axle hub for common rotation,

said free wheel hub mechanism including an electric motor and a contact case each connected to said hub body independently of said axle hub, whereby said hub body, said electric motor, and said contact case are attachable as a unit to said axle hub, said contact case carrying second electrical contact means electrically connected to said motor and arranged to make electrical contact with said first contact means when said hub body is attached to said axle hub, one of said first and second contact means being spring biased.

5,024,308

ONE-WAY CLUTCH AND HOLDER FOR TORQUE TRANSMITTING MEMBERS THEREOF

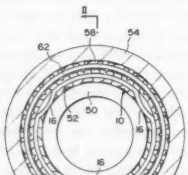
Yoshio Kinoshita, Ayase, and Mitsuharu Nawa, Fujisawa, both of Japan, assignors to NSK Warner K.K., Tokyo, Japan

Filed Jan. 19, 1989, Ser. No. 298,917

Claims priority, application Japan, Jan. 21, 1988, 63-11502

Int. Cl.[5] F16D *41/07*

U.S. Cl. 192—41 A **11 Claims**



1. A one-way clutch, comprising an inner race having a cylindrical outer contact surface, an outer race having an inner contact surface and disposed concentrically about said inner race, a plurality of torque transmitting members disposed in an annular space defined by said outer contact surface and said inner contact surface to allow relative rotation between said inner race and said outer race in one direction about a common axis of said inner race and said outer race and to prevent such relative rotation in an opposite direction, and an annular retainer disposed in said annular space for retaining said torque transmitting members in circumferentially spaced positions,

said retainer including an annular main body having a plurality of circumferentially spaced holes each receiving a respective torque transmitting member, one axial end portion of said main body having a radially inwardly protruding guide portion contacting said contact surface of said inner race, an opposite axial end portion of said main body having a plurality of circumferentially spaced portions each slit in a circumferential direction of said main body and means including circumferential segments of said opposite end portion adjacent to the slits for guiding said retainer and providing a predetermined drag between said retainer and said contact surface of said inner race, said circumferential segments being bent radially inwardly from said main body into generally arch-like shape as viewed in an axial direction of said main body sufficiently that they engage said contact surface of said inner race resiliently, in an outwardly flexed state, with a predetermined force to effect said guiding of said retainer and to provide said predetermined drag between said retainer and said contact surface of said inner race.

5,024,309

ROTATIONAL SPEED DIFFERENTIAL RESPONSIVE TYPE CONTROL COUPLING

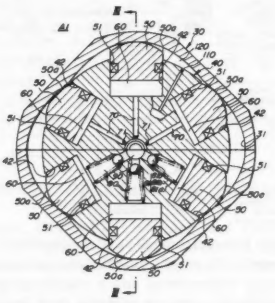
Toji Takemura, Yokohama, and Takashi Okubo, Yokosuka, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 20, 1989, Ser. No. 409,669

Claims priority, application Japan, Sep. 20, 1988, 63-123105[U]; Sep. 29, 1988, 63-245232

Int. Cl.[5] F16D *31/02*

U.S. Cl. 192—60 **7 Claims**



1. A control coupling comprising:

a first rotary member;

a second rotary member rotatable relative to said first rotary member;

oil discharge means responsive to a rotational speed differential between said first and second rotary members for discharging a quantity of oil proportional to said rotational speed differential;

restriction means for restricting discharge of oil by said oil discharge means and thereby producing an oil pressure for urging one of said first and second rotary members against that other; and

control means for controlling discharge of oil from said discharge means such that under a predetermined condition said discharge of oil from said discharge means is prevented thereby preventing substantial relative rotation of said first and second rotary members;

said control means including a spool chamber concentrically formed in said first rotary member and a spool movable in said spool chamber;

said oil discharge means including a plurality of discharge passages formed in said first rotary member and having ends directly connected to said spool chamber and equally spaced circumferentially along said first rotary member;

said spool being axially movable to open and close said ends of said discharge passages;

said discharge passages being grouped such that grouped two of said discharge passages have said ends opposed diametrically of said spool chamber and discharge oil of substantially the same pressure at any angle of said first rotary member relative to said second rotary member;

said spool having an outer periphery which cooperates with said ends of said discharge passages to constitute a variable orifice variable in opening depending upon variation of position of said spool relative to said first rotary member;

said control means including a rod installed concentrically on said first rotary member to extend between said spool chamber and outside of said first rotary member and movable together with said spool, and an electric actuator for actuating said rod and said spool to move relative to said first rotary member, said actuator being disposed outside of said first and second rotary members and supported on a stationary portion of an associated device.

5,024,310

CLUTCH PRESSURE CONTROL DEVICE FOR CONTINUOUSLY VARIABLE TRANSMISSION

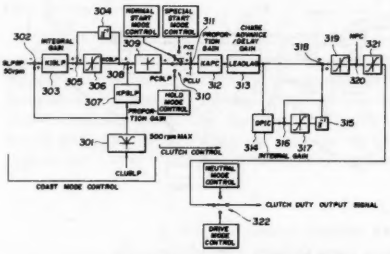
Katsuaki Murano; Yoshinori Yamashita; Sadayuki Hirano, all of Shizuoka; Takumi Tatsumi, and Hiroaki Yamamoto, both of Hyogo, all of Japan, assignors to Suzuki Jidosha Kogyo Kabushiki Kaisha, Shizuoka and Mitsubishi Denki Kabushiki Kaisha, Tokyo, both of Japan

Filed Nov. 29, 1989, Ser. No. 443,712

Claims priority, application Japan, Nov. 30, 1988, 63-302729

Int. Cl.[5] F16D *25/14;* B60K *41/02*

U.S. Cl. 192—0.076 **11 Claims**



1. An apparatus comprising: a transmission which has a progressively engageable clutch and which is operable in a plurality of predetermined operational modes, including a coast mode; and control means for controlling engagement of said clutch, wherein said control means includes means for determining an actual current slip of said clutch, and for determining an adjusted actual slip by taking an absolute value of said actual current slip and by reducing said absolute value to a predetermined maximum slip value when said absolute value exceeds said predetermined maximum slip value; and wherein said control means includes means for effecting feedback control of engagement of said clutch as a function of said adjusted actual slip with respect to a predetermined target slip so as to maintain said actual current slip substantially at said predetermined target slip.

5,024,311

ELECTROMAGNETIC SPRING CLUTCH

Masanori Osawa, Iida, Japan, assignor to Tenryu Marusawa Kabushiki Kaisha, Nagano, Japan

PCT No. PCT/JP88/00055, § 371 Date Jul. 25, 1989, § 102(e) Date Jul. 25, 1989, PCT Pub. No. WO88/05958, PCT Pub. Date Aug. 11, 1988

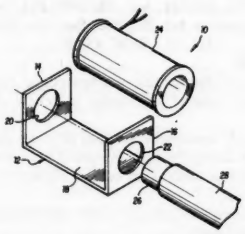
PCT Filed Jan. 25, 1988, Ser. No. 392,525

Claims priority, application Japan, Jan. 28, 1987, 62-011194

The portion of the term of this patent subsequent to Jul. 11, 2006, has been disclaimed.

Int. Cl.[5] F16D *27/00*

U.S. Cl. 192—84 T **7 Claims**



7. In an electromagnetic spring clutch for mutually engaging or disengaging a master driving axle and a slave driving axle by shift of an armature in the axial direction thereof,

an electromagnetic coil accommodated in a field core for shifting said armature,

said field core being made by cutting a rod which is U shape in section perpendicular to the axis of said rod, being of U shape in section and being in the form of a pair of mutually parallel, spaced end walls and a connecting wall perpendicular to said end walls and connecting said end walls together at a respective edge of each of said end walls, at least one of said end walls having an opening therethrough, said armature being rotatably received in each said opening.

5,024,312

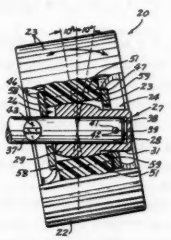
BOAT SUPPORT ROLLER ASSEMBLY

Byron L. Godbersen, Lake LaJune Estates, Ida Grove, Iowa 51445

Filed Apr. 12, 1990, Ser. No. 507,985

Int. Cl.[5] B60P *3/10*

U.S. Cl. 193—37 **10 Claims**



1. A roller assembly for supporting a boat on a trailer comprising:

annular hub means having a resilient circumferential surface for supportively engaging the hull of a boat when moved into contact therewith, said hub means having a bore formed axially therein;

bushing forming means comprising an annular member having an open portion at one end and a closed portion at the other with a bore formed axially therein, the open end portion of said member having a diameter larger than the closed end portion and having opposed convexly shaped surfaces extended axially thereof whereby to provide for swiveling movement of said hub means relative to said bushing forming means upon engagement between said convexly shaped surfaces with surfaces of said hub means bore;

a shaft inserted into said bushing means bore for placing said bushing means into contacting supportive engagement with said hub means bore surfaces;

swivel limiting means placed on either side of said annular member open end portion relative to said shaft and to said annular member closed end portion whereby to limit the degree of swiveling of said hub means; and

means connected to said shaft on either side of said swivel limiting means to locate and maintain said annular member open end portion within the axial extent of said hub means bore.

5,024,313
COIN RETURN CONTROL SYSTEM FOR VENDING MACHINES

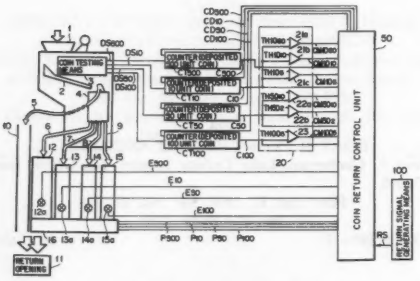
Tadashi Miyazawa, Tatebayashi, Japan, assignor to Sanden Coporation, Gunma, Japan

Filed Nov. 1, 1989, Ser. No. 430,171

Claims priority, application Japan, Nov. 2, 1988, 63-142682[U]; Nov. 11, 1988, 63-146676[U]; Nov. 11, 1988, 63-146677[U]

Int. Cl.[5] G07D *1/06*

U.S. Cl. 194—217 3 Claims



1. A coin return control system for vending machines comprising:

coin testing means for testing the authenticity and type of deposited coins including relatively smaller denomination coins and relatively larger denomination coins;

a plurality of deposited coin counter means responsive to said coin testing means for counting the number of each type of deposited coin;

a plurality of change retaining means for retaining each type of deposited coin;

coin paying-out means for paying out coins from said change retaining means according to paying-out signals;

a plurality of change running-out detecting means, each corresponding to a particular type of coin, for detecting whether the number of coins retained in particular change retaining means has reached a number not less than predetermined number and for generating a change running-out detecting signal;

return signal generating means for generating a coin return signal;

comparison means for comparing a first value corresponding to the number of relatively smaller denomination coins counted by a corresponding coin counter with a second value corresponding to the number of the smaller denomination coins that corresponds to a denomination of a larger denomination coin, and for generating a control signal if the first value is not less than the second value; and

coin return control means for generating a paying-out signal to cause a larger denomination coin to be returned instead of smaller denomination coins if, when said coin return signal is generated, 1) a change running-out detecting signal from a change running-out detecting means corresponding to a smaller denomination coin is generated, 2) said control signal is generated and 3) a change running-out detecting signal from a change running-out detecting means corresponding to a larger denomination coin is not generated; and

means for outputting said paying-out signal to said coin paying-out means.

5,024,314
ESCALATOR SYSTEM WITH CONVERTIBLE STEPS FOR WHEEL CHAIR

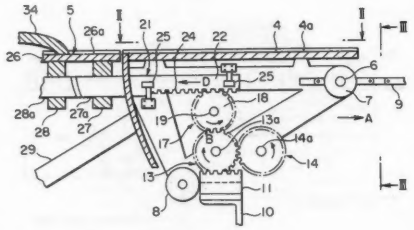
Shigeharu Kitamura; Haruhiko Nakamura, both of Inazawa, and Masaru Sanada, Osaka, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jun. 8, 1989, Ser. No. 363,082

Claims priority, application Japan, Jun. 9, 1988, 63-142024; Jun. 30, 1988, 63-163414; Jun. 30, 1988, 63-163415

Int. Cl.[5] B66B *23/12*

U.S. Cl. 198—333 13 Claims



1. An escalator system comprising:

a main frame defining a circulating path;

a first step disposed on the main frame for movement along the circulating path;

a second step disposed on the main frame adjoining the first step for movement along the circulating path, the second step having a movable tread movable between a raised position and a lowered position;

an operating mechanism mounted on the first step and comprising a support movable between a retracted position and an extended position in which it engages with and supports the movable tread;

a first rotatable member mounted on one of the steps and coupled with the operating mechanism for driving the operating mechanism to move the support from the retracted position to the extended position when rotated in a first direction;

a second rotatable member mounted on one of the steps and coupled with the operating mechanism for driving the operating mechanism to move the support from the extended position to the retracted position when rotated in the first direction;

a first engaging member mounted on the main frame for engaging with the first rotatable member and rotating the first rotatable member in the first direction; and

a second engaging member mounted on the main frame for engaging with the second engaging member and rotating the second rotatable member in the first direction.

5,024,315
METHOD OF DISTRIBUTING WORKPIECES BETWEEN A CONVEYOR AND WORKSTATIONS

William R. Ward, Columbus, Ohio, assignor to O-I Neg TV Products, Inc., Toledo, Ohio

Division of Ser. No. 766,721, Aug. 19, 1985, Pat. No. 4,760,671. This application Jul. 22, 1988, Ser. No. 223,454

Int. Cl.[5] B65G *43/00*

U.S. Cl. 198—341 13 Claims

8. The method if distributing workpieces to predetermined delivery locations spaced at regular intervals along a path comprising:

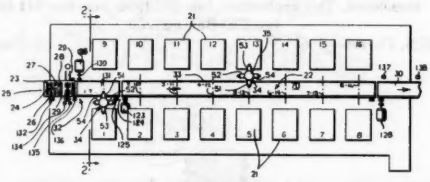
designating each workpiece for odd or even delivery locations spaced along the path in spatial sequence;

initially advancing designated odd workpieces one interval along the path;

initially advancing designated even workpieces two intervals along the path;

advancing simultaneously all workpieces, which are along

the path and which previously have been initially advanced, two intervals along the path in conjunction with each of said steps of initially advancing designated even workpieces two intervals along the path;



and alternately and cyclically performing the said steps of initially advancing designated odd workpieces and initially advancing designated even workpieces to position, between said advancing steps, designated odd workpieces at odd delivery locations along the path and designated even workpieces at even delivery locations along the path.

5,024,316

SORTING UNIT FOR BELT CONVEYOR SYSTEMS

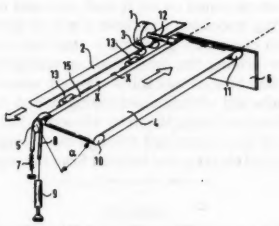
Mario Scata, and Adolfo Passero, both of Teramo, Italy, assignors to Meccanizzazione Postale E Automazione SpA, Piane di Sant'Atto, Italy

Filed Jul. 21, 1989, Ser. No. 382,759

Claims priority, application Italy, Jul. 21, 1988, 21432 A/88

Int. Cl.[5] B65G *37/00, 47/38;* **B07C** *5/36*

U.S. Cl. 198—369 **4 Claims**



1. A sorting unit for a belt conveyor system of the type comprising at least a sorting conveyor belt extending between transmission rollers revolvingly supported by a bar hinged to a steady framework, said sorting belt being swingable about an oscillation axis extending parallelly and close to a longitudinal edge actuating means to operate the sorting conveyor belt and control means for oscillating the sorting conveyor belt about said oscillation axis, bringing it from a rest position, where it lays horizontally flush with further conveyor belts being parts of said conveyor system, to a delivery position where it is transversally sloped downwardly, and viceversa, characterized in that said actuating means comprise an actuating belt extending parallelly to said oscillation axis and running in a direction opposite to the advancing direction of an object, at least one driving roller axially coupled to one of said transmission rollers and revolvingly arranged above said actuating belt, friction-coupled thereto my means of two counter-rollers located underneath said actuating belt in a position symmetrical with respect to the tangency line of said driving roller in such a way to assure in the rest position, the presence of a friction strength between the actuating belt and the driving roller.

5,024,317

METHOD AND APPARATUS FOR CLOSING CARTONS

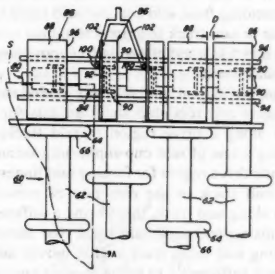
David S. Hemus, Cirencester, England, assignor to CMB Foodcan plc, Worcester, England

Filed Nov. 16, 1989, Ser. No. 437,631

Claims priority, application United Kingdom, Nov. 18, 1988, 8826962

Int. Cl.[5] B65G *19/00, 47/24;* **B65B** *7/20*

U.S. Cl. 198—415 **27 Claims**



12. In a method of closing cartons wherein the cartons are turned while being moved along a predetermined path, the method comprising the steps of advancing the cartons along the path in spaced apart relationship while supported from beneath but rotatable in a generally horizontal plane; moving a plurality of raisable restraint members along the path beneath the cartons at a location adjacent a side of each carton, said side extending generally in the direction of said path, the restraint members being normally disposed in lowered positions and spaced apart by a distance less than a length of said side of each carton, applying a yieldable raising force sequentially to the restraint members as they pass a raising station, whereby restraint members situated between adjacent cartons are raised, and moving the restraint members at a slower speed than the cartons, whereby said side of a carton situated behind a slower moving raised restraint member abuts and rotates about the latter as a fulcrum through a substantial angle.

5,024,318

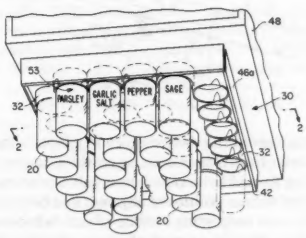
CONVEYOR STORAGE APPARATUS

Ralph W. Schwarze, 12468 Robleda Rd., Los Altos, Calif. 94022, and Thomas D. Dickson, Jr., 2427 Via De Los Milagros, Pleasanton, Calif. 94566

Continuation of Ser. No. 195,518, May 18, 1988, abandoned, which is a continuation of Ser. No. 47,153, May 6, 1987, abandoned. This application Jul. 18, 1989, Ser. No. 383,286

Int. Cl.[5] B65G *25/00*

U.S. Cl. 198—465.2 **27 Claims**



15. An apparatus for storing containers of spices or the like having an end with a size within a predetermined range of sizes, said apparatus comprising

conveyor track means defining a continuous loop track and

including a transfer station where containers are inserted into and removed from said apparatus;

a plurality of downwardly facing cups, each sized to receive a container having an end with a size within the predetermined range of sizes, a plurality of circumferentially spaced projections extending inwardly from the sides of said cup for engaging opposing edges of an end of a container received in said cup, said projections being radially movable and biased radially inwardly for engaging the edges of an end of a container received in said cup;

means extending from said cup into said track for supporting said cup in said track in a predetermined orientation relative to said track and allowing free movement of said cup along said track;

gear means having circumferentially spaced radially extending fingers and rotatable about an axis for moving said fingers along a drive region of said track, and thereby engaging a one of said cup-supporting means disposed in said track drive region for forcing said finger-engaged cup along said track in the direction of movement of said fingers along said track, there being a sufficient number of said cups supported in said track that movement of one cup along said drive track region moves said cups along said track sufficiently to move another cup into said track drive region for engaging by one of said fingers; and

motor means selectably operable in a first state for rotating said gear means in a first direction and in a second state for rotating said gear means in a second direction, and thereby moving said cups along said track in said first and second directions.

5,024,319

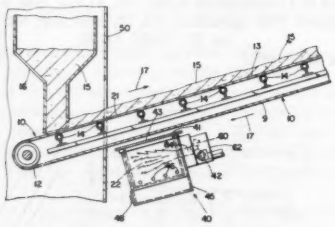
BELT HEATER FOR CONVEYORS

Steven C. Dixon, Rte. 3, Box 82D-4, and James W. Dixon, Rte. 3, Box 100, both of Oakland, Md. 21550

Filed Oct. 18, 1989, Ser. No. 423,014

Int. Cl.[5] B65G *45/00*

U.S. Cl. 198—494 **17 Claims**



1. In combination, a belt conveyor adapted for carrying granular coal or ore from a mine or crushing station which has ice adhering to said belt conveyor, a belt heater means in the form of a fuel burner positioned adjacent said belt conveyor for heating the coal supporting surface of said belt conveyor to a temperature sufficient to melt the ice adhering to said belt surface and to convert said ice to liquid water as long as said belt conveyor is moving and control means to shut off said burner when said belt conveyor stops and which starts said burner when said belt conveyor starts.

5,024,320

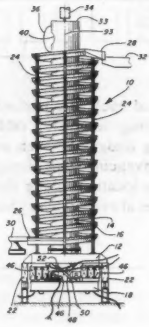
VIBRATORY SPIRAL ELEVATOR

Albert Musschoot, Barrington, Ill., assignor to General Kinematics Corporation, Barrington, Ill.

Continuation of Ser. No. 399,350, Aug. 28, 1989, abandoned, which is a continuation of Ser. No. 47,778, May 8, 1987, abandoned. This application Jun. 21, 1990, Ser. No. 541,487

Int. Cl.[5] B65G *27/02*

U.S. Cl. 198—756 **9 Claims**



1. In a drive for a spiral elevator having a base, isolation means for resiliently supporting the base on a surface, exciter means, means for resiliently supporting the exciter means on the base, said means for supporting the exciter means comprising a plurality of springs each extending angularly between and connected to the base and exciter means and rocker leg means extending angularly between and pivotally connected to the base and to the exciter means, said exciter means having associated therewith a pair of parallel shafts journaled thereon, said exciter means also having associated therewith vibration generating means mounted on each shaft and said exciter means further having associated therewith a pair of motors mounted thereon with one motor driving one shaft independent of the other motor driving the other shaft in resiliently associated relation to said base of said spiral elevator whereby in operation the shafts and vibration generating means reach an inertially synchronized state, whereby vibratory forces from said exciter means are transmitted through the springs to the base and to the spiral elevator and isolated from the support surface.

5,024,321

MODULAR CENTER DRIVE CONVEYOR BELT

James M. Lapeyre, New Orleans, La., assignor to Laitram Corporation, Harahan, La.

Continuation of Ser. No. 363,354, Jun. 2, 1989, abandoned, which is a continuation of Ser. No. 118,309, Nov. 6, 1987, abandoned, which is a continuation of Ser. No. 179,523, Aug. 19, 1980, Pat. No. 4,832,187. This application Mar. 29, 1990, Ser. No. 501,963

The portion of the term of this patent subsequent to May 23, 2006, has been disclaimed.

Int. Cl.[5] B65G *17/06*

U.S. Cl. 198—853 **48 Claims**

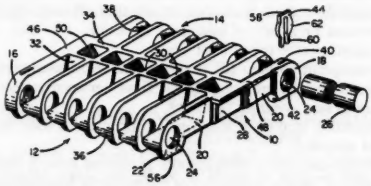
1. A module for use in constructing a linked conveyor belt comprising:

a body member having first and second pluralities of link ends;

at least two of said link ends of said first and second pluralities including an opening to receive a pivot rod to permit pivotable rotation of said module thereabout, said openings in said first and second pluralities defining respective first and second pivot rod axes; and

an abutment attachable to and cooperative with at least one of said at least two link ends for occluding at least a por-

tion of the respective opening to prevent the passage of a pivot rod through the opening, said abutment being in non-interlocking relation with said pivot rod, and being



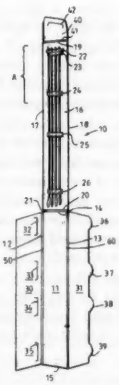
installable into and removable from a slot in said at least one link end, said slot extending in a direction transverse to a plane defined by said respective first and second pivot rod axes.

5,024,322

ARMED SUTURE PACKAGE

Henry A. Holzwarth, Weston, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Filed Apr. 27, 1990, Ser. No. 515,197
Int. Cl.[5] A61B *17/06*
U.S. Cl. 206—63.3 **12 Claims**



1. An armed suture package which comprises:

a) a cover panel defined by longitudinal sides and top and bottom transverse sides;

b) an armed suture-retaining panel defined by longitudinal sides and top and bottom transverse sides, the bottom transverse side of the armed suture-retaining panel being attached to the top transverse side of the cover panel, the length of the armed suture-retaining panel being greater than the length of the cover panel such that in the closed condition of the suture package, the cover panel will overlay less than the entire length of the armed suture-retaining panel thereby defining an open region for viewing and accessing the stored needles and their attached sutures;

c) needle-securing means attached to the armed suture-retaining panel at or near its top transverse side and within the open region thereof;

d) suture-securing means attached to the armed suture-retaining panel at one or more locations on said panel between the needle-securing means and its bottom transverse side;

e) first and second closure flaps, the first closure flap being attached to the cover panel along one longitudinal side thereof and the second closure flap being attached to the cover panel along the other longitudinal side thereof;

f) means for securing the first and second closure flaps in the closed condition of the suture package;

g) a third closure flap attached to the top transverse side of the armed suture-retaining panel, the length of the third closure flap being sufficient to cover the open region in the closed condition of the suture package; and,

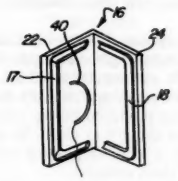
h) means for securing the third closure flap in the closed condition of the suture package.

5,024,323

SUTURE EXTENDER AND NEEDLE GUARD

Bernard Bolton, 18444 Cornell, Southfield, Mich. 48075

Filed Sep. 25, 1989, Ser. No. 412,006
Int. Cl.[5] A61B *17/06;* **B65D** *83/10*
U.S. Cl. 206—63.3 **14 Claims**



1. A suture-extender apparatus for the secure retention of a needle-type device, the needle type device having two ends, one end of the needle-type device being affixable to a suture, the apparatus comprising:

(a) a first member and a second member, the first member being large enough to encase both ends of the needle-type device, the first member and the second member each having an inner surface, the first and second member being sized and shaped to attain therewithin a surgical needle-type device;

(b) means for retaining the second member to the first member when the needle-type device is disposed therebetween, the retaining means having an engaged position and a disengaged position, both ends of the needle-type device being securely encaseable between the first member and the second member when the retaining means is in the engaged position;

the second member being permanently retainable with the first member when the retaining means is engaged; and wherein the suture-extender readily fits into a hand of a physician enabling the physician to complete a surgical procedure without exposure to puncture from the needle-type device.

5,024,324

SINGLE USE DENTAL FLOSS SPINDLE AND METHOD

Dale Whittaker, 1329 Quail Run Cir., Bentonville, Ark. 72712

Continuation-in-part of Ser. No. 461,846, Jan. 8, 1990, Pat. No. 4,972,946, and a continuation-in-part of Ser. No. 476,020, Feb. 6, 1990, Pat. No. Des. 312,710. This application Sep. 4, 1990, Ser. No. 577,146
Int. Cl.[5] A45D *40/24;* **A65D** *85/00*
U.S. Cl. 206—63.5 **20 Claims**

1. Spindles holding a single use length of dental floss in the form of a generally rectangular sheet of semi-rigid material less than three inches long and less than one inch wide having about one to three feet of dental floss removably secured thereon produced by the process steps of

(a) winding from about 6 to about 30 turns of dental floss transversely at a winding position on a semi-rigid elongated strip of sheet material greater than ten inches long and less than three inches wide,

(b) then leading dental floss from the immediate previous

winding position extending along a front face of said sheet material obliquely from one lateral edge of said strip at the immediate previous winding position to the opposite lateral edge at another winding position longitudinally at least one-fourth inch past the immediate previous winding position and winding from about 6 to about 30 turns of dental floss transversely on said strip at said another position,

(c) repeating step (b) at least five times,

(d) subsequent to step (b) removably adhering a portion of an elongated narrow pressure sensitive tape longitudinally over the front face of said sheet material and at least one dental floss winding thereon,

(e) repeating step (d) at least five times,

(f) subsequent to step (d) transversely cutting said elongated strip of sheet material, said dental floss and said web along a transverse line midway between successive ones of said winding positions,

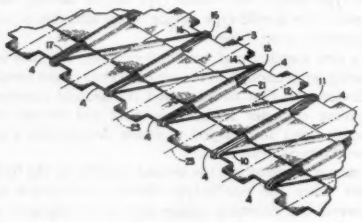
(g) repeating step (f) at least five times to produce at least one of said spindles,

(h) sealing each spindle produced in an air-tight envelope, and

(i) sterilizing the spindle, floss and interior of said envelope.

5. Spindles holding a single use length of dental floss in the form of a generally rectangular sheet of semi-rigid material having about one foot to about three feet of dental floss removably secured thereon produced by the process steps of

(a) winding from about 6 to about 30 turns of dental floss transversely at a winding position on a semi-rigid elongated strip of sheet material,



(b) then leading dental floss from the immediate previous winding position extending along a front face of said sheet material obliquely from one lateral edge of said strip at the immediate previous winding position to the opposite lateral edge at another winding position longitudinally at least one-fourth inch from the immediate previous winding position and winding from about 6 to about 30 turns of dental floss transversely on said strip at the last said another winding position,

(c) repeating step (b) at least once,

(d) subsequent to step (b) removably securing at least a portion of an elongated web longitudinally over the front face of said sheet material and at least one dental floss winding thereon,

(e) repeating step (d) at least once,

(f) subsequent to step (d) severing said elongated strip of sheet material, said dental floss and said web along a transverse line between successive ones of said winding positions,

(g) repeating step (f) at least once to produce at least one of said spindles.

9. A spindle holding a single use length of dental floss in the form of a generally flat sheet having at least about one foot of dental floss wound thereon produced by the process steps of

(a) winding at least about 6 turns of dental floss transversely at a winding position on an elongated strip of sheet material,

(b) leading dental floss from a previous winding position along a face of said sheet material from one lateral edge of said strip at said previous winding position to the opposite lateral edge at another winding position and winding at least about 6 turns of dental floss transversely on said strip at said another winding position,

(c) repeating step (b) at least once,

(d) subsequent to step (b) securing at least a portion of the dental floss lead from one to another of said winding positions on a face of said sheet material,

(e) repeating step (d) at least once,

(f) subsequent to step (d) severing said elongated strip of sheet material, and said dental floss between successive ones of said winding positions,

(g) repeating step (f) at least once to produce at least one of said spindles.

16. Single-use dental floss spindle produced from a strip of sheet material having a plurality of indentations punched along the edge thereof, by process steps of

(a) winding a strand of dental floss at the middle of a spindle position at least twice around the indentations of the first spindle position of said strip,

(b) advancing the strip so that the floss is laid across the face of the spindle to the middle of a second spindle position,

(c) taping the floss to the strip with pressure sensitive adhesive tape which runs perpendicular to the winding,

(d) severing a finished spindle and floss from the card,

(e) repeating the previous steps to produce additional spindles.

17. A method for producing spindles holding a single-use length of dental floss in the form of a generally flat sheet of material having dental floss wound thereon comprising the steps of

(a) winding at least about 6 turns of dental floss from a continuous strand at least 10 feet long transversely at a winding position on an elongated strip of sheet material,

(b) leading dental floss from a previous winding position along a face of said sheet material from one lateral edge of said strip at said immediate previous winding position to the opposite lateral edge at another winding position and winding at least about 6 turns of dental floss transversely on said strip at the last said another winding position,

(c) repeating step (b) at least once,

(d) subsequent to step (b) removably securing at least a portion of the dental floss extending between winding positions to the face of said sheet material,

(e) repeating step (d) at least once,

(f) subsequent to step (d) severing said elongated strip of sheet material, said dental floss and said web between successive ones of said winding positions,

(g) repeating step (f) at least once to produce at least one of said spindles.

5,024,325

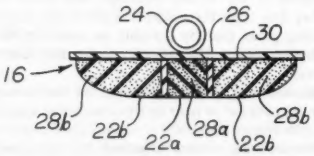
PREWETTED ABSORBENT PADS AND DISPENSING PACKAGE THEREFOR

Douglas P. Gundlach, Midland, Mich., assignor to DowBrands Inc., Indianapolis, Ind.

Filed Jan. 16, 1990, Ser. No. 465,854

Int. Cl.[5] **A45D** *35/00;* **A61M** *35/00*

U.S. Cl. 206—229 **7 Claims**



1. An absorbent pad for the application and/or removal of a vaporizable material to and/or from a selected surface, comprising:

an absorbent pad portion containing at least one absorptive

material, and having at least two discrete sub-portions separated by a flexible barrier to said vaporizable material;

a backing for at least a part of said absorbent pad portion, wherein said backing is resistant to permeation of said vaporizable material therethrough; and

means joined to said backing for manually manipulating the pad.

5,024,326

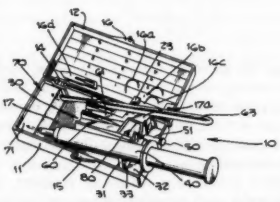
MEDICAL INSTRUMENT HOLDER AND SHARPS DISPOSAL CONTAINER

Dan Sandel, Tarzana, Calif.; Robert T. Horan, Tucson, Ariz.; Rodolfo Gaba, and Bruno J. Ramirez, both of Simi Valley, Calif., assignors to Devon Industries, Inc., Chatsworth, Calif.

Filed May 24, 1989, Ser. No. 356,131

Int. Cl.[5] **B65D** *83/10*

U.S. Cl. 206—366 **5 Claims**



3. A disposable, sterilizable plastic material device for facilitating the positioning of medical instruments having sharps associated therewith such as syringe needles, scalpel blades and the like during use thereof which facilitates the counting of such sharps and the subsequent disposal thereof, said device comprising:

a first container part having a magnetized material surface with indicia thereon for positioning, retaining and counting sharps laid thereon;

a second container part having an instrument positioning rest extending above an adjacent surface of said second part to facilitate the positioning of a medical instrument on said second part with a portion at least of said instrument extending upwardly away from said adjacent surface;

hinge means for hinging said first and second parts together to facilitate their being positioned in a side by side open position for receiving medical instruments thereon; and

a safety cushion member provided on said second container part and positioned relative said rest so that at least the tip of a sharp associated with a medical instrument positioned on said rest penetrates said member as a protection to any inadvertent puncture of the skin of a person manipulating said instrument and/or device as might otherwise occur if said tip where not so protected.

5,024,327

RESTRICTED ACCESS OPENING FOR DISPOSABLE SHARPS CONTAINERS

Richard A. Shillington, Leucadia, Calif., assignor to Med-Safe Systems, Inc., Carlsbad, Calif.

Filed Mar. 26, 1990, Ser. No. 499,021

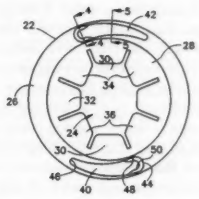
Int. Cl.[5] **B65D** *85/24*

U.S. Cl. 206—366 **17 Claims**

1. A limited access closure cover for an opening in a top of a disposable sharps container, comprising:

an annular rim for securing to the periphery of an open top of a container;

an opening in said closure, said opening having the configuration of a cross section axial view of a hypodermic syringe body and finger flanges on the syringe body for receiving the axial passage of the hypodermic syringe body when angularly oriented to conform thereto, said



opening including an oblong central area and a plurality of radial slots extending outwardly therefrom.

5,024,328

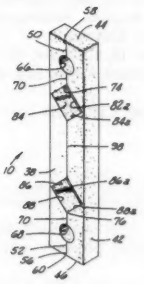
FOAM PACKING FRAME AND BLANK FOR FORMING THE SAME

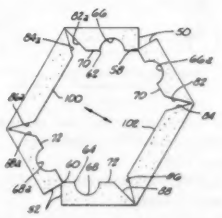
Rick L. Bontrager, Ripon, Calif., assignor to Great Western Foam Products Corporation, Hayward, Calif.

Filed Jul. 20, 1990, Ser. No. 556,320

Int. Cl.[5] **B65D** *85/30, 81/04*

U.S. Cl. 206—453 **7 Claims**





1. A blank formed of a material to act as a cushion to protect a fragile part when said blank is opened to present a packing frame to receive said part therein to protect the same from damage during shipping, said blank comprising:

a block of material having opposed ends and opposed sides extending between said ends and having front and rear surfaces wherein the thickness of said material between said front and rear surfaces corresponds to at least the thickness of said part, and the length of said block between said ends being greater than the width of said block between said sides;

said block being formed with a central cut parallel with said sides and extending between said ends and passing through said block, said cut terminating prior to said ends of said block forming a hinge area between said ends and the end of said cuts respectively, said block further including, spaced apart two pair of opposed V shaped corner

cutouts projecting on both sides of said central cut, said cutouts each terminating inwardly of said parallel sides forming hinge areas therebetween;

said block being capable of opening along said central cut and bending at said hinge areas forming a single piece quadrilateral packing frame wherein the length of said central cut between the respective ends and said respective V shaped cutouts forms two opposed interior sides of said frame, and the central cut between said pairs of V shaped cutouts forms two additional opposed interior sides of said frame as said V shaped cutouts are closed due to said opening of said frame forming mitered corners of said frame, and the exterior perimeter of said frame is governed by the length and width of said blank.

5,024,329

LOCKABLE CONTAINER FOR TRANSPORTING AND FOR STORING SEMICONDUCTOR WAFERS

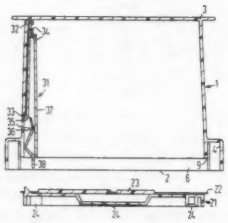
Peter Grohrock, Hoehenkirchen-Siegertsb, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 13, 1989, Ser. No. 322,112

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1988, 3813674

Int. Cl.[5] B65D *1/04*

U.S. Cl. 206—454 **29 Claims**



1. A container for transporting and storing semiconductor wafers in processing cassettes, comprising:

only one bottom plate;

only one hood, wherein said hood provides at an open end a perimeter sealing surface;

means for non-positive locking of the hood to the bottom plate, said means for non-positive locking comprising a receptacle means secured to said hood and a latching means engaging said receptacle means and said bottom plate;

means for sealing between said hood and said bottom plate, said means for sealing comprising a surface sealing lip joined to said bottom plate around an outer perimeter of said bottom plate, and extending laterally outward beyond said bottom plate in a cantilever fashion, said sealing lip pressed against said sealing surface when said container is closed; and

means for securing semiconductor wafers inside said container, said means for securing mounted to an inside surface of said hood, said means for securing moved into securing position adjacent said wafers by contact from said bottom plate when said container is closed.

5,024,330

PACKAGE FOR GROUPED ARTICLES

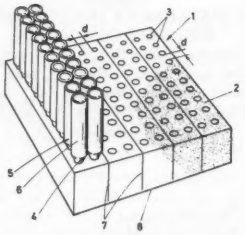
Philippe Servé, Overijse, Belgium, assignor to Societe Industrielle de Plastiques en abrege "Sipla", Brussels, Belgium

Continuation of Ser. No. 295,771, Jan. 11, 1989, abandoned. This application May 4, 1990, Ser. No. 518,331

Claims priority, application Belgium, Jan. 20, 1988, 08800076

Int. Cl.[5] B65D *73/00*

U.S. Cl. 206—486 **8 Claims**



1. A package for grouped articles having at least one extreme portion having an outside cross-section which is less than any analogous cross-section essentially parallel to the first-named cross-section, of another portion of these articles, in particular a package for ampules, flasks, vials, syringes, bottles, which comprises:

a support plate made of a relatively resilient, semi-rigid cellular material such as polyethylene, polyurethane, polystyrene, rubber, in at least one face of which a number of holes are provided in each of which said extreme portion of said articles can be removably maintained, each said hole having an axis extending substantially perpendicularly to the support plate and being shaped so as to enable to introduce said extreme portion substantially according to the direction of this axis into the holes,

the other portion of the articles being thus located on the outside of the support,

the distance between two adjacent holes being such that the other portion of the articles can extend side by side so as to bear substantially against each other and to form with the support a substantially rigid assembly when their extreme portion is at least partially inserted in said holes,

said material having a sufficient rigidity, and the diameter of the holes being slightly less than the maximum diameter of said extreme portion of the articles, to be able, on the one hand, to elastically grip the above-mentioned extreme portion of the articles to be packaged in the holes and, on the other hand, to maintain these articles in position when they are arranged side by side with said extreme portion in the holes.

5,024,331

PACKING WRAPPER FOR PACKAGING PASTY PRODUCTS AND PASTY PRODUCT PACKAGED THEREWITH

Jean Litzler, Heimsbrunn, France, assignor to Fromageries Bel, Paris, France

Filed Apr. 26, 1989, Ser. No. 343,137

Claims priority, application France, Apr. 26, 1988, 88 05527

Int. Cl.[5] B65D *65/34, 85/76*

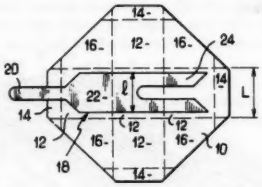
U.S. Cl. 206—551 **6 Claims**

1. A packing wrapper for packaging pasty products of parallelepipedic form, said wrapper comprising a foldable foil forming five faces (12) with dimensions substantially equal to the faces of the parallelepiped, and an opening device (18) for opening said packing wrapper by tearing said packing wrapper, said device consisting in a foil of foldable material, wherein said opening device comprises:

an active portion (22) consisting in a single strip of a constant width extending over three consecutive said faces (12)

with parallel longitudinal outer edges arranged substantially along the sides of three consecutive said faces (12) to be torn;

a tongue (20) of reduced width, defined by two parallel longitudinal edges and a terminal edge, integral with said active portion (22), disposed at one end of the single strip



and forming a grasping means extending beyond the wrapper and accessible from the outside; and

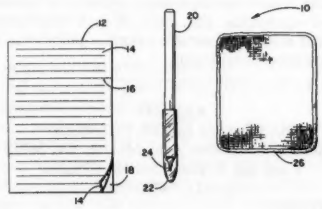
a central cutout (24), the profile of which matches that of the entire tongue and is defined by two parallel longitudinal edges and a terminal edge, disposed at the other end of said active portion.

5,024,332

NON-SMEAR ERASABLE LABEL KIT

Richard J. Stachler, 11647 Red Gulch Ct., Gold River, Calif. 95679

Filed Aug. 6, 1990, Ser. No. 563,109
Int. Cl.[5] B65D *85/00*
U.S. Cl. 206—575 **8 Claims**



1. An erasable label kit, comprising,

(a) a plurality of reusable self-adhesive labels having a fist side and a second side, said first side having an adhesive coating and said second side having a non-adhesive vinyl coating;

(b) a marking pen containing water soluble ink for placing identifying information on said second side of said labels, said ink when applied to said second side of said labels being smudge-resistant and smear-resistant and highly resistant to erasure under normal handling.

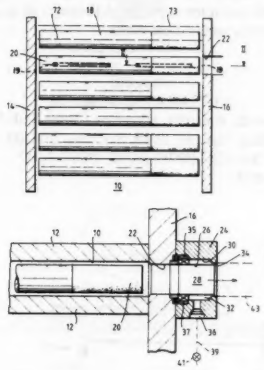
5,024,333

CIGARETTE SEGREGATING APPARATUS

Andre Brink, Pretoria, South Africa; Michael J. Cahill, Coventry, England; John Dawson, Coventry, England; Juilian W. Gardner, Coventry, England, and Alan A. Thierry, Coventry, England, assignors to Molins PLC, Milton Keynes, England

Filed Sep. 11, 1989, Ser. No. 405,261
Claims priority, application United Kingdom, Sep. 15, 1988, 8821652.8
Int. Cl.[5] B07C *5/34;* A24C *5/345*
U.S. Cl. 209—535 **25 Claims**

1. Apparatus for segregating faulty cigarettes comprising a passage along which cigarettes are arranged to pass in a direction substantially transverse to their lengths in a single row, means for testing cigarettes to identify faulty cigarettes to



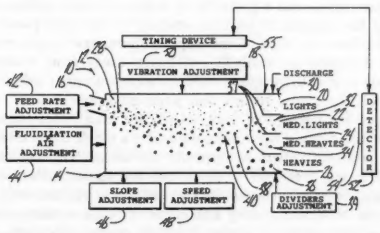
be segregated, and means for ejecting faulty cigarettes from the passage, the ejecting means comprising suction means for initiating axial movement of faulty cigarettes from said passage.

5,024,334

METHOD AND MEANS FOR GRAVITY TABLE AUTOMATION

Manjit K. Misra, and Yuh-Yuan Shyy, both of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Jun. 9, 1989, Ser. No. 363,727
Int. Cl.[5] B07C *5/342;* B03B *4/00*
U.S. Cl. 209—557 **13 Claims**



1. A gravity separation table automation means comprising:

a gravity separation table for separating materials including one or more adjustment means for controlling operation of the table;

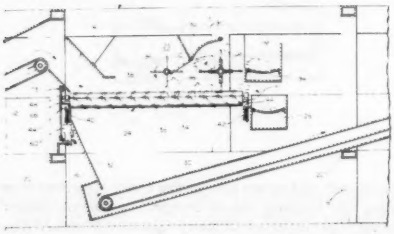
control particles having generally uniform movement characteristics relating to one or more of the set comprising size, weight, density, and specific gravity, and following a generally similar predictable movement through the table during operation;

detector means operatively associated with the gravity separation table for detecting the predictable movement of the control particles during operation of the gravity table, the control particles having at least one known detectability

characteristic which is detectable by the detector means and which differentiates the control particles from the materials being separated; and

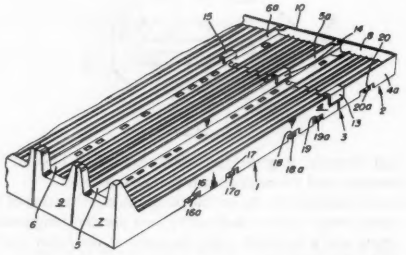
the detector means further comprising a timing means for the control particles movement through at least a portion of the gravity separation table.

5,024,335
AUTOMATIC SORTER
Vernon J. Lundell, Box 171, Cherokee, Iowa 51012
Filed Nov. 30, 1988, Ser. No. 278,329
Int. Cl.[5] B07B *13/05*; B07C *5/00*
U.S. Cl. 209—618 **13 Claims**



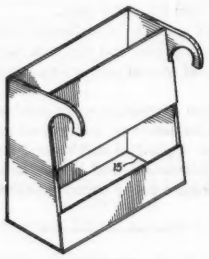
1. A sorter for separating generally cylindrical aluminum beverage cans from paper material, items larger than cans and material thicker than paper material comprising a plurality of generally horizontally disposed, parallel, adjacent, cylindrical rollers to form an upwardly facing surface to receive mixed paper material and aluminum beverage cans at one end of the rollers, the other end of said rollers discharging cans therefrom, means rotatably driving said rollers, each of said rollers including a spiral rib on the exterior surface thereof for gripping paper material and moving it downwardly between adjacent rollers, said ribs engaging the external, curved surfaces of the aluminum beverage cans and items larger than cans and moving the cans and larger items toward the discharge ends of the rollers and engaging and moving the beverage cans longitudinally of the rollers and off discharge ends thereof, means conveying the aluminum cans from the discharge ends of the rollers and means conveying the paper material from under the rollers, said rollers including a plurality of adjacent upper rollers supported for rotation about axes oriented generally in the same plane and a plurality of adjacent lower rollers supported for rotation about axes oriented in the same plane disposed below the axes of the upper rollers, said upper rollers being mounted for resilient movement away from a normal position to enable the space between adjacent upper rollers and between the upper rollers and adjacent lower rollers to be enlarged for passage of material thicker than paper material, said means driving the rollers including a single drive chain to drive adjacent rollers in opposite directions with the lower rollers being arranged in pairs and the upper rollers being arranged in pairs between the pairs of lower rollers, each pair of lower rollers including a first lower roller rotating clockwise a second lower roller rotating counterclockwise and forming an upwardly facing trough therebetween with the upwardly facing surfaces of the trough moving upwardly and outwardly, each pair of upper rollers including a first upper roller rotating counterclockwise and a second upper roller rotating clockwise and forming an upwardly facing trough therebetween with the upwardly facing surfaces of the trough moving upwardly and outwardly, said first upper roller of each pair of rollers being disposed adjacent the second lower roller of each pair and forming an upwardly facing trough therebetween with the upwardly facing surfaces forming the trough moving downwardly and inwardly to grip and pull paper material downwardly between adjacent upper and lower rollers.

5,024,336
COMPOSITE ORGANIZER
William S. Spamer, Roswell, Ga., assignor to The Mead Corporation, Dayton, Ohio
Filed Jul. 24, 1990, Ser. No. 557,523
The portion of the term of this patent subsequent to Sep. 25, 2007, has been disclaimed.
Int. Cl.[5] A47F *7/00*
U.S. Cl. 211—59.2 **8 Claims**



1. A composite structure for supporting and displaying articles and comprising a main support unit including a main rectangular planar element having front, rear and opposed side edges, an auxiliary support unit including an auxiliary rectangular planar element having front, rear and opposed side edges, one edge of said auxiliary rectangular planar element being of a configuration which is irregular and complementary to one irregular edge of said main rectangular planar element to define a disjointable irregular junction between said units, a reinforcing under structure integrally formed with the lower surfaces of said units and including a plurality of spaced apart longitudinal reinforcing ribs, each of said longitudinal ribs being severed at said disjointable irregular junction to accommodate separation of said units.

5,024,337
BAND AND LABEL CARRIER
Larry D. Bailey, 167 E. Pine Ave., Mobile, Ala. 36572
Filed Jul. 3, 1989, Ser. No. 375,276
Int. Cl.[5] A47F *5/08*
U.S. Cl. 211—88 **8 Claims**



1. A rubberband and sensitive sticker dispenser for use with a dolly having bars or a level surface comprising:

(a) A bottom having a front and rear;

(b) A left side having a front and rear and a top and a bottom, the top defining a hanger member at the rear;

(c) A right side member having a front and rear and a top and a bottom with the top defining a hanger member at the rear so that both hanger members allow for mounting the device on the dolly bars attached along its lower end to the bottom at the side opposite the left side;

(d) An upper facing attached to the front of the left side and right side members opposite the hangers;

(e) A lower facing attached to to the front of the left side and right side opposite the hangers and contacting the front of the bottom so that the upper facing and lower facing define a space between the top of said lower facing and the bottom of the upper facing;

(f) An upper backing attached to the rear of the left and right side directly below the hangers and extending downward attached to the rear of the left and right sides;

(g) A lower backing attached to the rear right side and left side below the upper backing so as to define a back opening and attached to the bottom at the rear of the left and right side;

(h) A divider shelf extending between the upper facing and the upper backing above the back opening so as to separate the interior of the container so formed into an upper chamber and lower chamber.

5,024,338

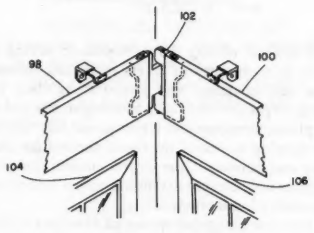
DRAPE ROD ASSEMBLY

Griffith D. Austin, Rte. 2, Box 143, Vilas, N.C. 28092

Filed Mar. 14, 1989, Ser. No. 322,897

Int. Cl.[5] A47H *1/02*

U.S. Cl. 211—105.1 **6 Claims**



1. A drape rod assembly comprising:

first and second elongated drape rods each of which supporting drapery material;

a hinge; said first and second elongated drape rods connected together by said hinge forming a continuous mounting structure for said drapery material whereby said first and second elongated drape rods may be mounted at various angles with respect to each other thereby presenting an uninterrupted appearance for said drapery material; said hinge including first and second members and means for rotatably holding said members together thereby enabling said members to be moved relative to one another; each elongated drape rod including a receptacle on at least one end; at least a portion of said first member received in said receptacle of said first elongated drape rod and at least a portion of said second member received in said receptacle of said second elongated drape rod; each member having a pair of tabs; said tabs received in respective receptacles.

5,024,339

PLASTICS BOTTLE

Horst H. Riemer, Mid Glamorgan, England, assignor to Mendle Limited, United Kingdom

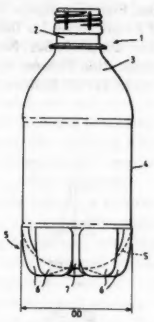
Filed Feb. 23, 1990, Ser. No. 484,092

Claims priority, application United Kingdom, Feb. 27, 1989, 8904417

Int. Cl.[5] B65D *1/02, 23/00*

U.S. Cl. 215—1 C **18 Claims**

1. In a plastics bottle for carbonated drinks having a side wall, a base, a central area in said base, circumferentially spaced projecting feet in said base surrounding said central area, and substantially parallel-sided straps lying between and separating said spaced projecting feet, the improvement wherein said central area and said straps together define a continuous smooth domed surface with no re-entrant portions, and wherein a ratio of the combined width of said straps to the



outside circumference of said base is in a range from 1:5.5 to 1:6.5.

5,024,340

WIDE STANCE FOOTED BOTTLE

Alfred C. Alberghini, Dunwoody; David A. Brunson, Marietta, and Stephen R. Lynn, Douglasville, all of Ga., assignors to Sewell Plastics, Inc., Atlanta, Ga.

Continuation-in-part of Ser. No. 556,174, Jul. 23, 1990, abandoned. This application Oct. 4, 1990, Ser. No. 592,778

Int. Cl.[5] B65D *1/02, 1/42, 23/00*

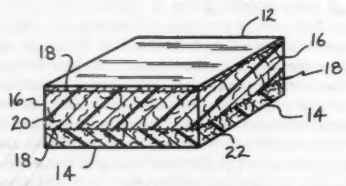
U.S. Cl. 215—1 C **24 Claims**

1. A blow-molded bottle of thermoplastic resin having a hollow body with a generally cylindrical side wall rotationally symmetric about a longitudinal axis of the bottle, and an integral base merging with the side wall, the base being defined by an outer surface comprising a plurality of arcuately extending downward projections separated from each other by hemispherical segments extending from the cylindrical side wall to the longitudinal axis of the bottle, each of said arcuately extending downward projections having a first inclined portion contiguous to the longitudinal axis, a second inclined portion situated radially outside of, and axially displaced downwardly from, the first inclined portion, a generally perpendicular ring segment having an upper edge united with the first inclined portion and a lower edge united with the second inclined portion, and a radially outwardly and upwardly curved portion defining the axially lower most extent of each downward projection and having an inner edge united with the second inclined portion and an outer edge united with the cylindrical side wall.

5,024,341
NIPPLE ADAPTER FOR A BOTTLE COMPRISING A SCREW RING
Benoit Dekerle, Evian, France, assignor to Societe Anonyme des Eaux Minerales d'Evian, Evian les Bains Cedex, France
Filed Apr. 25, 1990, Ser. No. 514,007
Claims priority, application France, Apr. 25, 1989, 89 05445
Int. Cl.[5] A61J *11/04*; B65D *47/42, 51/24*
U.S. Cl. 215—11.1 3 Claims

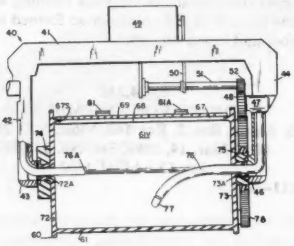
1. An adapter for adapting a nipple end-piece having an internally threaded ring onto a bottle having an outer threaded neck, said adapter comprising an outer threaded sidewall for receiving said internally threaded ring of the endpiece, an internally threaded chimney within said sidewall adapted for cooperating with said neck of the bottle, and a skirt within said chimney and connected to said chimney, shaped and positioned so that it cooperates sealingly with an internal face of the neck of the bottle when the adapter is fixed thereon by screwing its chimney onto said neck of the bottle.

5,024,342
CORROSION RESISTANT CONTAINERS
Barry J. Dallum, 1007 Cheyenne Dr., Montgomery, Tex. 77356, and David H. Bartlow, 272 Bellingrath, Conroe, Tex. 77301
Continuation of Ser. No. 267,889, Nov. 7, 1988, abandoned. This application Sep. 8, 1989, Ser. No. 404,798
Int. Cl.[5] B65D *90/02, 25/14*
U.S. Cl. 220—468 5 Claims



1. A composite wall adaptable for use in the containment of an organic liquid consisting of:
a structural outer layer composed of a resin reinforced with chopped glass strands; and,
an inner layer positioned adjacent said outer layer, said inner layer being in contact with said organic liquid, said inner layer composed of a resin mixed with a surface-modified inorganic filler dispersed homogenously through said inner layer, wherein said filler and said resin are chemically linked to form a barrier to restrict penetration of said organic liquid into said inner layer thereby reducing the effect of said organic liquid on said wall.

5,024,343
CONTAINER ASSEMBLY AND METHOD
Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840
Continuation-in-part of Ser. No. 631,619, Jul. 17, 1984, abandoned. This application Oct. 21, 1985, Ser. No. 789,648
Int. Cl.[5] B65D *7/00*
U.S. Cl. 220—326 19 Claims

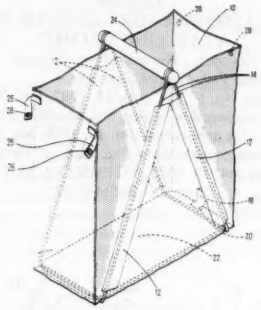


1. In a molded plating barrel container having a side wall formed with a plurality of facets extending substantially the length of said container and joined along their longitudinal edges, and respective end walls forming an integral and unitary molded plastic structure and wherein said side wall is provided with an opening in one of the facets thereof for charging and emptying said container, the improvements comprising:
(a) a removable closure extending across said opening in said side wall of said container,
(b) at least one elongated spring-like retainer for holding said closure in engagement with said container side wall across said opening, said spring-like retainer having a central portion and respective end portions extending at acute angles to said central portion,
(c) said side wall of said container being formed with a plurality of retaining formations shaped for receiving and holding respective of said end portions of said retainer, each of said retaining formations being integrally molded as an extension of a respective facets of the side wall of said container, said molded retaining formations being located diametrically across said said container on opposite sides of said opening in said side wall so as to permit a retainer having its ends engaging respective of said retaining formations to cause the central portion wall of the container.

5,024,344
REUSABLE, FLEXIBLE BAG WITH FOLDABLE SUPPORT STRUCTURE
Kyle S. Paula, 140 S. Canon Dr., Beverly Hills, Calif. 90212
Filed Dec. 6, 1990, Ser. No. 622,846
Int. Cl.[5] B65D *33/06*
U.S. Cl. 220—9.3 16 Claims

1. A reusable, flexible bag, incorporating a foldable support structure, to be used for containment of an item or items comprising:
a) a bag body made of a sheet of flexible material having essentially vertical walls and an essentially horizontal bottom wall which form a container with an opening at the top;
b) a handle;
c) a pair of support members made of a semi-rigid material having horizontal portions which extend under said bottom wall and having upwardly extending portions with ends, said upwardly extending portions extending up along said vertical walls with said ends located above said

opening of said bag body, said ends swingably attached to said handle;



d) a bottom panel made of a rigid material formed to lie inside said bag body coextensive with said bottom wall freely attached to said bag body.

5,024,345

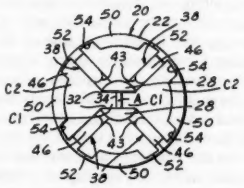
VEHICLE AIR VENTING CAP

Kevin R. Deweerdt, Walled Lake, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Dec. 10, 1990, Ser. No. 625,200

Int. Cl.[5] **B65D** *51/16;* **F16H** *57/04*

U.S. Cl. 220—366 **4 Claims**



1. A one-piece vent cap adapted to be received on one end of a flexible hollow elastomeric tubular conduit having a cylindrical cross section, said tubular conduit having the other end thereof sealingly connected to a vent hole in a housing enclosing an automotive component, said one-piece vent cap comprising:

an integrally formed flexible elastomeric cup-shaped vent cap having a cylindrical outer wall closed at one end thereof by an end wall, a central stem element projecting from said end wall inner surface thereof such that the symmetrical axis of said stem element coincides with the principal axis of said vent cap;

said stem element comprising a pair of mirror image posts with each said post having a semi-circular cross section, said pair of posts disposed in spaced opposed relation on either side of a first transverse plane of symmetry which includes said vent cup principal axis, said pair of posts having two opposite outer semi-cylindrical surfaces and two opposing inner planar parallel surfaces interconnected by an axially coextensive web, said web defining a second plane oriented normal to said first plane whereby said web portion and said opposed inner surfaces define a pair of axially coextensive oppositely facing central stem channels;

four uniformly spaced axially extending radial L-shaped ribs radiating from the principal axis of said vent cap, each said L-shaped rib comprising an axial leg portion and a radial foot, each said post semi-cylindrical outer surface joining radially inner vertical edge portions of an adjacent pair of said foot sections, said outer wall joining radially outer vertical edge portions of each said leg portion, whereby inner peripheral edge portions of the leg portions thereof and its associated post defining therebetween an intermediate concentric space having a predetermined radial extent adapted for fixedly receiving one end of the flexible hollow conduit therein, and whereby each said foot portion defining a radial inner edge providing a stop adapted to position said conduit one end in a predetermined axially spaced relation with said end wall, said end wall defining with said conduit free end two crossover radial passages;

each pair of adjacent ribs defining with said vent cap outer wall a pair of diametrically opposed arcuate sectioned axially extending outer channels;

said hollow conduit having a central passage of circular section sized to telescopically receive said pair of posts therein in a snug-fit manner, whereby said conduit central passage inner surface thereof defining with said pair of central stem channels a pair of sealed axially extending inner air passages and said conduit outer surface thereof defining with said pair of outer channels a pair of outer venting passages, such that said pair of crossover radial passages providing air flow communication between associated inner venting passages and associated outer venting passages so as to provide venting of said housing with the atmosphere.

5,024,346

CONTAINER FOR STORING AND TRANSPORTING A LIQUID WITH A DEFORMABLE LINER WHICH ASSISTS DRAINAGE

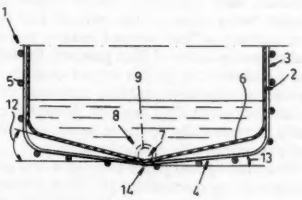
Georges Roser, Wingen/Moder, France, assignor to Sotralentz S. A., Drulingen, France

Filed Feb. 14, 1990, Ser. No. 479,709

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1989, 3905976

Int. Cl.[5] **B65D** *33/56, 88/62*

U.S. Cl. 220—401 **2 Claims**



1. A storage and transport container for a fluent material, the container comprising:

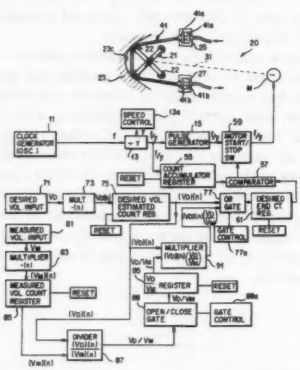
a stiff outer vessel having an upright side wall formed of a grid of steel bars and a floor, the floor being inclined with respect to the horizontal downward to a predetermined low point at the side wall; and

an elastically deformable liner in the vessel having a side and a base respectively of shapes generally corresponding to the side wall and floor of the vessel and provided at the low point with a drain fitting, the base being elastically deformed to lie flatly on the floor of the vessel when the liner is completely filled with the fluent material, the base being inclined when the liner is only partially filled with the fluent material to the horizontal to the low point at an angle substantially greater than that between the vessel floor and the horizontal due to the inherent elasticity of the respective shapes of the side and base of the liner.

5,024,347
ADJUSTABLY CONTROLLABLE ACCURACY-ENHANCING PUMP ARRANGEMENT AND METHOD

Brian E. Baldwin, 7891 S. Argonne St., Aurora, Colorado 80016

Filed Jun. 8, 1988, Ser. No. 203,924
Int. Cl.[5] B67B *7/00*
U.S. Cl. 222—1 **31 Claims**



1. The method of reducing inaccuracy in total quantity of fluid pumped by a pump comprising:

actuating a pump through a first given amount of pump activity which is estimated will yield a first selected output quantity of a given fluid pumped through a given conduit based on assumed calibration factor of a selected amount of pump activity per unit volume dispensed,

measuring the amount of the actual output quantity of said fluid which is pumped through said conduit by said first given amount of pump activity,

and applying an adjustment factor to the amount of pump activity which would be calculated to be required based on said assumed calibration factor, for further pumping activity to effect selected further pumped output quantity production, said adjustment factor when applied as a multiplier being equal to the ratio of said first selected output quantity of fluid pumped relative to said measured actual output quantity of fluid pumped, for further pumping of a said selected further output quantity.

17. A pump arrangement enabling reduction of inaccuracy in the amount of output fluid pumped through a conduit by

a digitally incrementally operable pump, comprising

a digitally incrementally operable pump,

means for actuating said pump through a first given amount of pump activity represented by a first quantity of digital increments, which is estimated will yield a first selected output quantity of a given fluid pumped through a given conduit based on an assumed calibration factor of a selected amount of pump activity per unit volume dispensed,

means for applying an adjustment factor to the amount of pump activity which would be calculated to be required based on said assumed calibration factor, for further pumping activity to effect selected further pumped output quantity production,

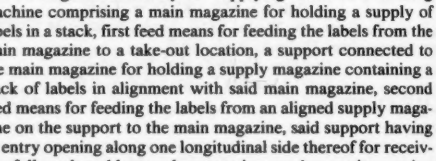
said adjustment being applied as a multiplier which is equal to the ratio of said first selected output quantity of fluid pumped relative to an actual measured output quantity of fluid pumped through a given said conduit as a result of said estimated number of increments of actuation of said pump,

and means for subsequently pumping a selected output quantity of said given fluid through said conduit by actuating said pump a number of increments equal to the product of said adjustment factor and said estimated quantity of increments corresponding to said selected output quantity.

5,024,348
MAGAZINE ASSEMBLY FOR LABELS OR THE LIKE IN A LABELING MACHINE

Hermann Kronseder, Regensburger Strasse 42, D-8404 Wörth/Donau, Fed. Rep. of Germany

Division of Ser. No. 97,323, Sep. 11, 1987, Pat. No. 4,799,605, which is a continuation of Ser. No. 824,648, Jan. 31, 1986, abandoned. This application Jul. 14, 1988, Ser. No. 218,990
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1985, 3503621; Jul. 13, 1985, 3525035; Oct. 11, 1985, 3536294
Int. Cl.[5] B65H *1/30*
U.S. Cl. 221—11 **13 Claims**



1. A magazine assembly for supplying labels to a labeling machine comprising a main magazine for holding a supply of labels in a stack, first feed means for feeding the labels from the main magazine to a take-out location, a support connected to the main magazine for holding a supply magazine containing a stack of labels in alignment with said main magazine, second feed means for feeding the labels from an aligned supply magazine on the support to the main magazine, said support having an entry opening along one longitudinal side thereof for receiving full replaceable supply magazines and an exit opening located on the opposite longitudinal side of the support from the entry opening for discharging empty supply magazines, a supply magazine feed device disposed adjacent said entry opening for supplying full replaceable supply magazines to said support, said feed device including a slideway extending laterally outwardly from the opening side of the support in a direction transverse to the label feed direction and the longitudinal side of the support, said slideway adapted to hold a plurlaity of full supply magazines in side-by-side and contacting relationship with one another, means for continuously feeding said full supply magazines while in said relationship along the slideway toward and onto said support in a direction transverse to the label feed direction, said magazine feeding means comprising at least one smooth, endless belt extending between return pulleys that engages with the underside of the magazines on the slideway and means for turning said belt, means for ejecting empty supply magazines from said support and stop means located on the longitudinal side of the support opposite from said opening side to arrest and align a full supply magazine on the support with the main magazine, said stop means comprising at least one vertically displaceable cam adapted to be raised above the level of said support to engage a side of a supply magazine on the support and lowered to a position below said support to permit an empty supply magazine to be ejected from said support and means for raising and lowering said cam.

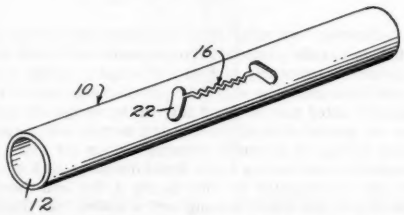
5,024,349
TUBE DISPENSER FOR FLEXIBLE SHEET MATERIAL

Edwin W. Haenni, Hartsville, and Hans-Peter Bolz, Greenville, both of S.C., assignors to Sonoco Products Company, Hartsville, S.C.

Filed May 9, 1989, Ser. No. 349,289
Int. Cl.[5] B65H *1/00*
U.S. Cl. 221—46 **10 Claims**

9. A storage and dispensing tube for receiving a package of flexible bags joined in a continuous strip with transverse severance lines between adjacent bags, and for allowing the sever-

ance and dispensing of individual bags from the package in response to a continuous pull on said bags; said tube being elongate with a hollow interior and opposed ends, a dispensing slot defined in said tube centrally along the length thereof for the dispensing of bags therethrough from the tube interior, said slot being elongate, inwardly spaced from the opposed ends of the tube and of a length comprising a minor portion of the length of the tube, said slot to receive and dispense said bags along the full length of the slot, said slot including an elongate central portion with means for engaging the severance line between a leading bag and a following adjacent bag for resisting free movement of the following bag therethrough while allowing for a manual outward pulling of the leading bag through said full length of said slot with sufficient resistance to effect severance of the leading bag from the following bag and the strip of bags as the corresponding severance line engages said elongate central portion during a continuous pull on the leading bag, said slot including means for positioning the following bag and holding a side edge of the bag with a portion of the following bag retained by and outwardly projecting and holding from said slot, said means for positioning the following bag comprising an end portion of the slot to one end of the elongate central portion, said end portion, along the length of the slot, being of a length substantially less than the length of the central portion, said end portion being transversely enlarged relative to said central portion and including peripheral edges allowing passage of a leading portion of the following bag, adjacent a corner thereof, through the end portion of the slot with reduced resistance relative to the central portion and prior to severance of the leading bag from the following bag, whereby a corner of the following bag outwardly projects through the end portion of the slot to allow for a manual grasping of the projecting corner for withdrawal of the following bag through the slot with the corner manually retained for manipulation of the withdrawn bag and such that the side edge of the bag is held to effect a force on the package thereby tending to stabilize the package with the tube.



5,024,350

DISPENSING APPARATUS

Stephen P. Shoemaker, Jr., 123 International Boardwalk, Redondo Beach, Calif. 90277

Filed Jan. 10, 1990, Ser. No. 462,836
Int. Cl.[5] G07F *11/36*
U.S. Cl. 221—75 **11 Claims**

5. A dispensing apparatus for dispensing items at a plurality of locations, comprising:

a series of support assemblies each comprising means for releasably supporting a plurality of items to be dispensed;

each support assembly being rotatable between a supporting position and a dispense position in which one item is released and dispensed;

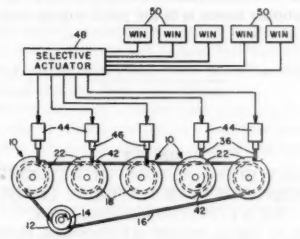
a single drive means for driving all of said support assemblies towards said dispense position;

transmission means for drivably connecting said drive means to each support assembly along a transmission path;

releasable stop means in the transmission path to each support assembly for selectively cutting off the drive to that assembly;

control means for controlling each stop means to selectively release one or more of said stop means for selectively actuating one or more of said support assemblies to dispense an item;

said drive means comprising a single drive gear motor, said transmission means including a series of driven rollers each associated with a respective one of said support assemblies, a continuous belt extending from said drive gear motor around each of said driven rollers, and clutch means between each driven roller and the respective support assembly for transmitting rotation of said driven roller to said support assembly; and



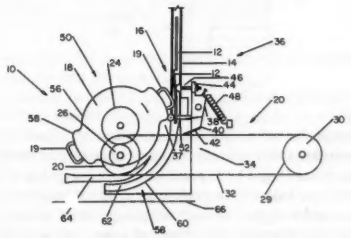
each support assembly including a rotatably mounted support plate, said clutch means being sandwiched between said support plate and said driven roller, said support plate having a recess and said stop means comprising a stop member moveable between a first position extending into said recess for preventing rotation of said support plate and a second position retracted from said recess to allow rotation of said support plate, and an actuator for controlling movement of said stop member between said two positions.

5,024,351

DISPENSER DEVICE FOR REMOVING PLANAR PANELS FROM A HOPPER

Byron L. Lowe; Robert T. Lewis; Kenneth M. Milliner, and Everett N. Finn, all of Macon, Ga., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Feb. 26, 1990, Ser. No. 485,022
Int. Cl.[5] B65G *59/00;* **B65H** *3/00*
U.S. Cl. 221—277 **5 Claims**



1. A dispenser device for removing planar panels one at a time from a feed hopper in which the panels are stored in end-to-end vertical relationship comprising:

a panel engagement drum disposed at the discharge end of the feed hopper having a peripheral direction of rotation in adjacent tangential alignment with the direction of discharge of the panels from the feed hopper;

means for continuously rotating the panel engagement drum;

friction means located at preselected spaced apart intervals around the perimeter of the panel engagement drum for sequentially frictionally engaging subsequent bottom-most panels in the hopper and sequentially extracting the panels from the hopper as the drum continuously rotates;

positioner means, alternately movable between panel en-

gagement and panel disengagement positions for engagement and disengagement with the bottom-most panel at the hopper discharge for positioning the bottom-most panel for engagement by the friction means of the drum; and,

stop means operatively responsive to the movement of the positioner means alternatively movable between panel disengagement and engagement positions for engagement with the penultimate one of the panels in the hopper when the positioner means is in the panel disengagement position and for disengagement with a penultimate panel when the positioner means is in the panel engagement position.

5,024,352

APPARATUS FOR THE AUTOMATIC DETERMINATION OF A CONTINUOUS BULK MATERIAL THROUGHPUT BY A CONTINUOUS BALANCE

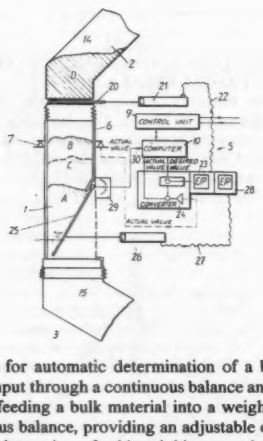
Bruno Gmür, St. Gallen, and Bernd Kühnemund, Flawil, both of Switzerland, assignors to Gebrueder Buehler AG, Uzwil, Switzerland

Continuation of Ser. No. 948,350, Nov. 6, 1986, Pat. No. 4,944,428. This application Feb. 22, 1990, Ser. No. 484,351

Claims priority, application Switzerland, Apr. 4, 1985, 01485/85

Int. Cl.[5] **G01G** *11/14*

U.S. Cl. 222—1 **17 Claims**



1. Process for automatic determination of a bulk material flow throughput through a continuous balance and comprising the steps of feeding a bulk material into a weighing vessel of the continuous balance, providing an adjustable closure member in an outlet region of said weighing vessel as a movable wall part of said vessel and adjusting a size and a shape of an outlet opening of said weighing vessel by moving said adjustable closure member to position the adjustable closure member in said weighing vessel, said outlet region defining a substantially vertical pathway of said vessel for the bulk material flow and said movable wall part having a vertical component which partially defines said pathway; providing measuring means on said vessel and measuring the weight of said weighing vessel while feeding the bulk material into the weighing vessel, controlling the throughput of bulk material by control means which operatively interconnect said weight measuring means and said adjustable closure member, and controlling the adjustable closure member to provide a continuous mass flow of material through of said weighing vessel while simultaneously measuring the weight of said weighing vessel.

5,024,353

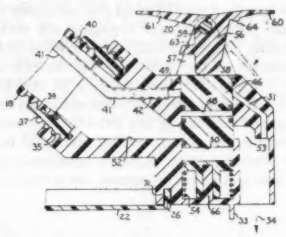
DISPENSER FOR REFRIGERATED LIQUIDS

David M. Horne, 4472 Garwood Dr., Ladson, S.C. 29456

Filed Dec. 11, 1989, Ser. No. 448,339

Int. Cl.[5] **B67D** *3/00*

U.S. Cl. 222—185 **4 Claims**



1. A dispenser for a refrigerated carbonated liquid beverage, comprising a cradle adapted for positionment on the shelf of a refrigerator to removably support a beverage container in an inverted tilted condition, with the liquid discharge neck of the container located near the front edge of the refrigerator shelf below the general plane of the container bottom wall; a valve housing having an internally threaded section for screw-on attachment of the housing to the liquid discharge neck of the container; an elongated air tube having a first end thereof connected to said valve housing and a second end thereof locatable within the inverted beverage container in near proximity to the container bottom wall; a vertical axis socket formed in said valve housing; a plug valve element slidably arranged in the socket for movement in a vertical direction; an air supply passage system extending through the valve housing, said air supply passage system comprising an air passage (**49**) extending between said first end of the air tube and a side surface of said plug valve element; a liquid discharge passage system extending through the valve housing for conveying liquid from the container through the valve housing, said liquid discharge passage system comprising a liquid passage (**52**) extending between the internally threaded section of the housing and a side surface of said plug valve element; a first hole extending transversely through the plug valve element for potential communication with said air passage; a second hole extending transversely through the plug valve element for potential communication with said liquid passage; spring means located within said socket for biasing the plug valve element upwardly to a position wherein said first hole communicates with said air passage, and said second hole communicates with said liquid passage; and a manual operator means connected to said plug valve element for moving said valve element downwardly to a position wherein the transverse holes are out of fluid communication with the respective passages.

5,024,354

COLLAPSIBLE DISPENSING CONTAINER

William Ledewitz, 31 Brookwood Dr., Woodbridge, Conn. 06525

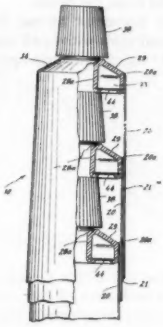
Continuation-in-part of Ser. No. 891,057, Jul. 28, 1986, abandoned, which is a continuation of Ser. No. 607,731, May 9, 1984, abandoned, which is a division of Ser. No. 568,281, Jan. 4, 1984, Pat. No. 4,493,439, which is a continuation-in-part of Ser. No. 284,826, Jul. 20, 1981, abandoned, which is a continuation-in-part of Ser. No. 208,663, Nov. 20, 1980, abandoned. This application Sep. 1, 1987, Ser. No. 91,322

Int. Cl.[5] **B65D** *35/22;* **B67D** *5/60*

U.S. Cl. 222—94 **2 Claims**

1. A method of packing a plurality of open ended collapsible dispensing tube-like containers in a nested assembly, each having a common longitudinal axis, and each being provided with a cap, for handling and shipping comprising: fabricating each tubular body of the collapsible tube with about a one

degree external taper over the entire length of said tubular body and providing ahead portion having a neck with an extension which extends toward the bottom end of the tube and the end surface of said extension being proximate to the open end of said tube functioning as an abutment stop, the combined distance between the top surface of said cap and the bottom surface of said extension of each tube-like container being so selected to form a gap of 0.0055 inches between adjacent tube walls over the entire length thereof when the tubes



have the same longitudinal axis, and nesting a series of said containers by inserting each successive container in the open end of a prior container with its cap abutting the abutment stop of said neck extension resulting in an elongated package of containers whereby each entire tubular body wall is spaced from the entire adjacent tubular body wall by 0.0055 inches to prevent lacking of the nested tubes and to facilitate high speed and automatic de-nesting, since less side pressure is required to be applied to each tubular body in order to separate the tubular body from the remainder of the nested assembly.

5,024,355

DEVICE FOR DISPENSING A LIQUID OR A CREAM IN SMALL-VOLUME DROPS, AND AN ASSOCIATED DISPENSING ASSEMBLY

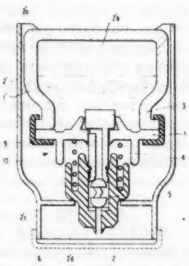
Claude Jouillat, Montigny Sur Avre, and Michel Brunet, Sainte Colombe La Commanderie, both of France, assignors to Societe Technique de Pulverisation—STEP, Paris, France

Filed Dec. 20, 1989, Ser. No. 454,652

Claims priority, application France, Dec. 20, 1988, 88 16867; Apr. 6, 1989, 89 04538

Int. Cl.[5] B67D *5/64*

U.S. Cl. 222—162 **27 Claims**



1. A dispenser device for dispensing a liquid or cream type substance in the form of small volume drops, the device comprising:

a pump body having a pump chamber formed therein with a bottom wall and an enclosure whose end furthest from said bottom wall is open;

a piston adapted to engage an inside of said enclosure via said open end and to slide in sealed manner therein between a high, admission position for admitting said substance into said chamber and a low, rest position, said piston being fixed to a rod of smaller diameter which passes in a sealed manner through said bottom wall of said chamber and has a free end extending outside said pump body, said rod being pierced by a central channel communicating with a duct opening out laterally beneath said piston;

an endpiece having a dispensing orifice and adapted to be fastened in a sealed manner to said free end of said rod extending outside said pump body in such a manner that said central channel faces said orifice;

resilient means disposed between said pump body and said endpiece for returning said piston to said low, rest position in which it comes into abutment against said bottom wall of said chamber; and

an outlet valve disposed between said central channel of said rod and said dispensing orifice of said endpiece.

5,024,356

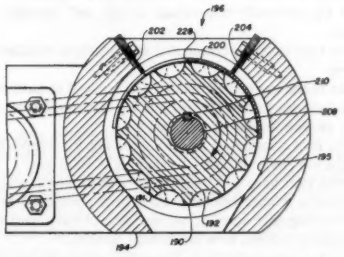
METHODS, SYSTEMS, APPARATUS AND ROTOR FOR APPLYING GRANULAR MATERIAL

Joseph F. Gerling, West Grove, Pa., and Raymond A. Kaczmarczyk, Jr., Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 16, 1989, Ser. No. 311,516

Int. Cl.[5] B65D *88/54*

U.S. Cl. 222—312 **11 Claims**



6. An apparatus for metering granular material substantially without pulsing and attrition comprising:

a rotor having an axis of rotation and an outer circumferential surface having indentations arranged in the surface in circumferential rows with each of the rows offset with respect to adjacent rows such that any radial plane including the axis contains a substantially constant cross section of the indentations;

a housing for partially enclosing and supporting the rotor, the housing having a first and a second opening, each of the openings providing access to the rotor surface, the openings spaced from one another;

a gate having a cylindrical surface positionable between the housing and the rotor to selectively control the size of the first housing opening; and

a blocking mechanism positioned adjacent the rotor cylindrical surface to prevent excess material from entering the first housing opening,

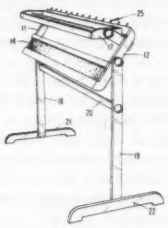
whereby when the material is fed by gravity to the first housing opening, the rotor is rotated with respect to the gate and the housing, and the gate is positioned to open the first housing opening, then the material is metered through the apparatus and out the second housing opening.

5,024,357

LATCH HOOK FRAME

Thomas F. Anderson, Star Route Box 87-A, Leonardtown, Md. 20650

Filed Apr. 17, 1990, Ser. No. 509,848
Int. Cl.[5] A41H 5/00, 31/00
U.S. Cl. 223—106 12 Claims



1. A latch hook frame comprising:
a harp having a rectangular frame including a left member, a right member, back, middle and front lateral members connected to said left member and right member, and a flat surface attached to the underside of the middle and front lateral members;
a plurality of pegs attached to said back lateral member of said harp and projecting therefrom, for holding canvas;
a left tray support attached near the rear end of said left member of said harp;
a right tray support attached near the rear end of said right member of said harp;
a tray pivotally connected to said left tray support and pivotally connected to said right tray support;
a left leg pivotally connected to said left member of said harp;
a right leg pivotally connected to said right member of said harp;
a main brace connected to said left leg and to said right leg;
a left foot connected to said left leg for supporting said left leg perpendicular to said left foot;
a right foot connected to said right leg for supporting said right leg perpendicular to said right foot; and
wherein said harp pivotally adjusts at an angle position for allowing a user hooking yarn to a canvas to view said canvas against said flat surface of said harp, and said tray pivotally adjusts to a horizontal position.

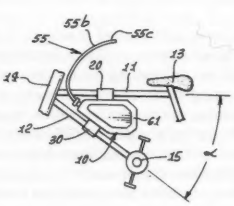
5,024,358

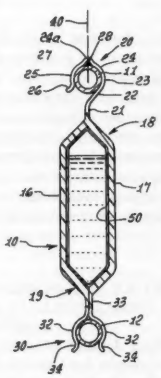
THERMAL-INSULATED FLUID RECEPTACLE REMOVABLY SUPPORTED ON BICYCLE FRAME

Ricardo H. Reichert, Pasadena, and Alberto J. Reichert, West Covina, both of Calif., assignors to Schlumberger Industries Limited, Hampshire, England

Filed Nov. 22, 1989, Ser. No. 440,340
Int. Cl.[5] B62J 9/00
U.S. Cl. 224—35 7 Claims

1. For use with a bicycle having a tubular frame including a forwardly extending first tube projecting forwardly from near the seat of the steering column, and a second tube projecting downwardly and rearwardly from the steering column at an angle relative to the first tube and toward the pedal rotor bearing, the two tubes defining an upright frame plane that extends forwardly, an improved liquid bottle apparatus comprising in combination:
(a) a substantially flat, relatively narrow bottle having opposite sides which are substantially parallel and adapted to extend in parallel relation to said frame plane when the bottle is positioned between said first and second tubes,
(b) the bottle having a forwardly elongated upper side adapted to extend parallel to and beneath the first tube,
(c) the bottle having a forwardly and upwardly elongated lower side adapted to extend parallel to and above the second tube,
(d) a first snap connector integral with the bottle and projecting above said upper side thereof to snap connect to the first tube, and a second snap connector integral with the bottle and projecting forwardly and downwardly below said lower side thereof to snap connect to the second tube,
(e) and duct means extending within the bottle interior and to the upper exterior of the bottle so that a bicyclist can insert the upper end of the duct means into his mouth to withdraw liquid from the bottle.
(f) said first snap connector having laterally opposed forwardly elongated sides with hook shape to hook over the first tube and to engage and grip opposite sides of the first





tube, and said second snap connector has like laterally opposed, forwardly and upwardly elongated and spaced apart sides to resiliently spread apart and engage and grip opposite sides of the second tube, whereby the bottle is firmly positioned and held to the frame against rotation about either tube and against displacement lengthwise relative to either of the first and second tubes, the connectors having divergent portions adapted to receive the tubes therebetween and to be yieldably spread apart as said portions are snapped onto the tubes,
(g) the bottle having a relatively short forward corner side that extends downwardly at an angle relative to said bottle upper side, said corner side defining an opening to the bottle interior, and including a bottle neck registering with said opening, a cap rearwardly attached to said neck, and said duct extending through the cap.

5,024,359

BICYCLE COOLER

Jan B. Thomas, 22 Deallyon #40, Hilton Head, S.C. 29929

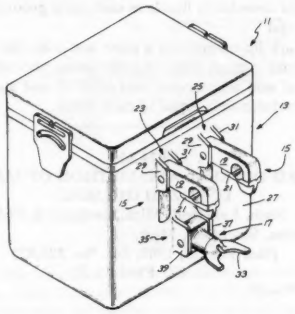
Filed Jan. 16, 1990, Ser. No. 465,913
Int. Cl.[5] B62J 7/06, 7/00
U.S. Cl. 224—36 22 Claims

1. A container for detachable connection to the head and handlebar intersection of a bicycle frame comprising:

a container having a back side,

the back side having a first securement arm member, a second securement arm member and a foot member;

the arm members being symmetrically positioned about a vertical centerline on the container back side and adapted to mount over the bicycle handlebar and for securement thereto; and



the foot member located below the arm members on the vertical centerline, said foot member having an extension member and a base member, said extension member being rotatable relative to said base member for extending the physical length of said foot member outwardly and against the bicycle head.

5,024,360

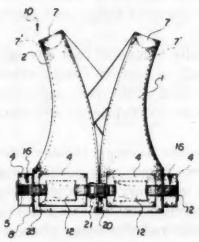
VEST OR LIKE ARTICLE OF CLOTHING FOR CARRYING RECHARGEABLE BATTERIES

Norton Rodriguez, 8782 SW. 12th St., #102, Miami, Fla. 33174

Filed Jan. 5, 1990, Ser. No. 461,395

Int. Cl.[5] A45F *3/04;* **A41D** *1/00*

U.S. Cl. 224—215 **17 Claims**



1. An article of clothing designed for the support of a plurality of batteries about an upper portion of a person's body, said article comprising:

a base including a front portion and a rear portion each respectively dimensioned and configured to substantially cover an upper, frontal portion and an upper, rear portion of the user's body,

said front portion of said base including two front panels each joined to a separate one of two rear panels of said rear portion at corresponding upper ends to define shoulder portions disposed to overlie and be supported over a substantial surface of the shoulders of the user so as to equally distribute a load thereon,

said base further comprising a waist portion disposed in overlying and at least partially surrounding relation to a waist of the user,

a plurality of chambers mounted on an exterior of adjustable stabilizing means mounted on the exterior of said base in a substantially surrounding relation to said chambers and said waist portion thereof and structured and disposed for stabilizing the batteries within said plurality of chambers so as to prevent excessive movement of the batteries relative to the waist of the user and for selectively altering the size of said base relative to the waist portion of a wearer,

adjustment means on said base structured and disposed for selectively altering the length of said front and said rear panels relative to the length of the upper portion of the user's body, and plurality of batteries to be disposed within said chambers and a load to the batteries.

5,024,361

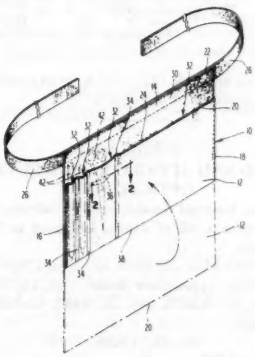
SUPPLY CADDY

Joyce D. Flowers, 6330 Beechwood St., Philadelphia, Pa. 19138

Filed Jul. 6, 1989, Ser. No. 376,129

Int. Cl.[5] A45F *5/00*

U.S. Cl. 224—223 **5 Claims**



1. A supply caddy comprising:

a rectangularly-shaped continuous piece of material which is folded and defines a pocket, at least a portion of the inner walls of the pocket being comprised of loop pile material;

at least one double-faced strip which mates with the inner walls of the pocket, with at least a portion of hook pile material on both faces, and is repositionable within the pocket; and,

at least one single-faced strip which mates with the inner wall of the pocket, with at least a portion of hook pile material on the one face, and is repositionable within the pocket to further subdivide it.

5,024,362

TEAR-EDGE GUARD

Lars-Åke Karlsson, Skebokvarnsvägen, Sweden, assignor to Metsä-Serla OY, Mänttä, Finland

Filed Jan. 31, 1990, Ser. No. 472,740

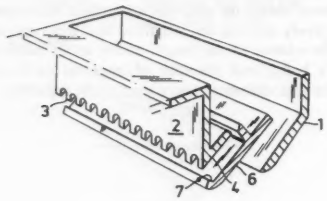
Claims priority, application Sweden, Feb. 7, 1989, 8900418

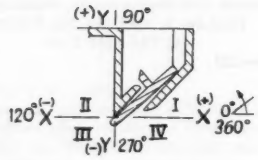
Int. Cl.[5] B26F *3/02*

U.S. Cl. 225—20 **6 Claims**

1. A tear-bar guard, which is elongated so as to extend along the entire length of a tear-edge of a tear-bar, and movable into an active protective position in which the guard extends externally beyond the tear-bar, said elongated tear-bar guard being abuttable with the tear-bar (2) when subjected to a force within an angle of 270°–360° relative to a coordinate system in which

the tear-bar extends 180° from 90°–270° and faces an object to be severed, said guard being movable to one side when a force





is applied within an angle 185°–270° so as to expose the tear-bar (2) to permit severing of the object.

5,024,363

METHOD AND APPARATUS FOR CUTTING AN OPTICAL FIBER

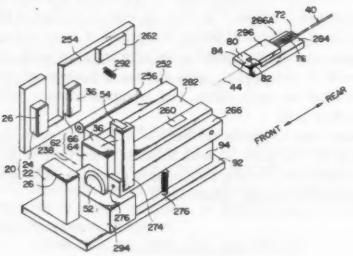
Hirohisa Suda; Katsumi Sasaki, both of Sakura, and Yasukuni Osato, Narashino, all of Japan, assignors to Fujikura Ltd., Tokyo, Japan

Filed Mar. 28, 1988, Ser. No. 174,072

Claims priority, application Japan, Jun. 16, 1987, 62-92322; Oct. 24, 1987, 62-163028; Oct. 24, 1987, 62-268727; Nov. 11, 1987, 62-284844

Int. Cl.[5] C03B *37/16*

U.S. Cl. 225—96.005 **3 Claims**



1. An optical fiber cutting apparatus comprising:

a main body comprising at least three clamps for clamping an optical fiber set straight, each of said at least three clamps including a pincher and a table, said pinchers of said at least three clamps being mounted to a common support, a predetermined two adjacent clamps of said at least three clamps including means for clamping a bare portion of the fiber and a remaining one clamp of said at least three clamps including means for clamping a sheathed portion of the fiber;

said main body further comprising:

a scoring blade, provided between said predetermined two adjacent clamps of said at least three clamps, for making a score on at least one side of said optical fiber;

a pushing member for pushing said optical fiber from an opposite side of said score to cut said optical fiber;

a base on which said at least three clamps, said scoring blade and said pushing member are provided at predetermined positions; and

a set table provided on a straight alignment line of said at least three clamps on a side of an outermost one of said at least three clamps and having a guide groove formed on a top surface thereof;

an adapter comprising a plate having first and second guides formed in accordance with a type of an optical fiber to be cut, and detachably fitable in said guide groove of said set table; and

a stationary jig comprising a plate and a lid, for securing a multicore optical fiber therebetween, the sizes of said plate of said adapter and said plate of said stationary jig being substantially equal to each other.

5,024,364

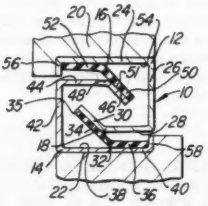
UNITIZED OIL SEAL AND METHOD OF MAKING A UNITIZED OIL SEAL

Stephen E. Nash, Lakeland, Mich., assignor to Federal-Mogul Corporation, Southfield, Mich.

Filed Feb. 13, 1989, Ser. No. 308,920

Int. Cl.[5] F16J *15/32*

U.S. Cl. 277—35 **16 Claims**



1. A seal assembly, comprising:

an annular radially inner seal case having an axially extending radially inner wall, a first flange extending radially outwardly from said inner wall, and a first axial flange connected to the first flange and spaced from the inner wall;

an annular radially outer seal case having an axially extending outer wall, a second flange extending radially inwardly from said outer wall, and a second axial flange connected to the second flange and spaced from the outer wall;

a first annular wafer having a radially inner portion secured to said inner seal case at a position spaced radially outwardly from said inner wall and having a radially outer portion extending between the first axial flange and said outer wall, said radially outer portion circumferentially contacting said outer wall; and

a second annular wafer having a radially outer portion secured to said outer seal case at a position spaced radially inwardly from said outer wall and having a radially inner portion extending between the second axial flange and said inner wall, said radially inner portion circumferentially contacting said inner wall, said first and second wafers being spaced apart from one another in a non-contacting relationship during use.

5,024,365

APPARATUS FOR DISPENSING FASTENERS

Donald L. Bourque, Millis, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Filed Sep. 15, 1989, Ser. No. 407,629

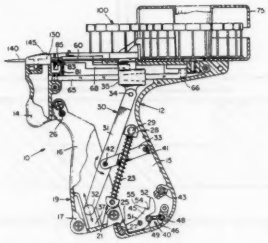
Int. Cl.[5] B25C *5/11*

U.S. Cl. 227—67 **15 Claims**

1. Apparatus for dispensing a fastener to a slotted hollow needle, from stock formed by a plurality of fasteners, each

having a filament with an angularly disposed bar at one end, comprising

means, including a trigger, for advancing the fastener stock to a location within said apparatus at which an individual fastener is separated from said stock, and for forcing the bar of the individual fastener through the bore of the needle with its associated filament projecting through the slot of the needle;



an antiback mechanism which cooperates with the trigger so that when the trigger is partially depressed to a predetermined point the antiback mechanism engages the trigger and prevents its return, until the trigger is fully depressed forcing the antiback mechanism to an out-of-the way position.

5,024,366

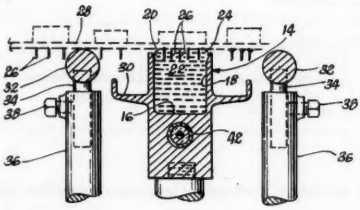
DESOLDERING VAT

Henry I. Kim, 12665 Salmon River Rd., San Diego, Calif. 92129

Continuation-in-part of Ser. No. 403,168, Sep. 5, 1989. This application Jul. 25, 1990, Ser. No. 557,682

Int. Cl.[5] B23K *3/00, 3/06*

U.S. Cl. 228—56.1 **6 Claims**



1. A desoldering vat comprising:

(a) a stand;

(b) an elongated solder pot mounted on said stand and having an upper edge substantially defining a horizontal plane and a heating means to melt solder contained within said solder pot;

(c) a moat defined along at least one side of said pot to catch solder spilled out of said pot on said at least one side; and,

(d) a horizontal support brace supported on said stand substantially parallel to said elongated pot and substantially spanning the entire length thereof.

5,024,367

WIRE BONDING METHOD

Yoshimitsu Terakado, and Nobuto Yamazaki, both of Tokyo, Japan, assignors to Kabushiki Kaisha Shinkawa, Tokyo, Japan

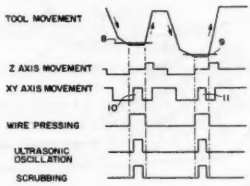
Filed May 14, 1990, Ser. No. 523,007

Claims priority, application Japan, May 15, 1989, 1-118599

Int. Cl.[5] H01L *21/607*

U.S. Cl. 228—111 **2 Claims**

1. A wire bonding method in which a bonding wire is pressed against bonding surfaces by a bonding tool and bonding is performed by applying ultrasonic vibrations to said bonding tool, said method is further characterized in that said bonding tool is also moved in a lateral direction of the bonding



surface to make a scrubbing action while said bonding tool to which said ultrasonic vibrations is applied presses said wire against said bonding surfaces.

5,024,368

STOPPING-OFF METHOD FOR USE WITH DIFFUSION BONDING

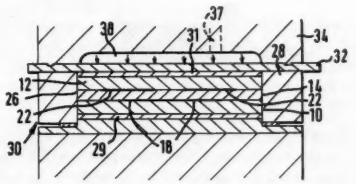
Ian E. Bottomley, and Graham A. Cooper, both of Preston, United Kingdom, assignors to British Aerospace, London, England

Filed Jul. 17, 1990, Ser. No. 553,321

Claims priority, application United Kingdom, Aug. 1, 1989, 8917613

Int. Cl.[5] B23K *20/24*

U.S. Cl. 228—118 **19 Claims**



1. A method of diffusion bonding components together, which method comprises:

(a) plasma spraying a stopping-off material on at least one selected area of a first surface of a first component;

(b) juxtaposing the said first component with at least a second component to form a stack in which the said first surface of the said first component lies adjacent to the second component, and

(c) heating and pressing together the components in the stack to form a diffusion bond between the first component and the second component, the stopping-off material preventing such bonding in the said at least one selected area.

5,024,369

METHOD TO PRODUCE SUPERPLASTICALLY FORMED TITANIUM ALLOY COMPONENTS

Francis H. Froes, Xenia, and Daniel Eylon, Dayton, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 5, 1989, Ser. No. 348,741

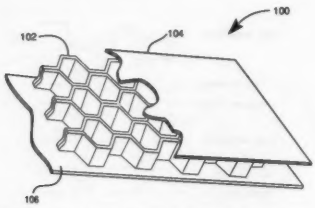
Int. Cl.[5] B23K *20/20*

U.S. Cl. 228—157 **9 Claims**

1. A method for producing a titanium alloy honeycomb-core structural panel which comprises the steps of:

(a) forming a plurality of rapidly solidified titanium alloy strips into waveform structures;

(b) assembling a plurality of said waveform structures to produce a honeycomb core;



(c) positioning said core between two cover pieces of rapidly solidified titanium alloy sheetstock; and

(d) diffusion bonding said core to each of said cover pieces.

5,024,370

AUTOMATIC SOLDERING METHOD AND THE APPARATUS THEREOF

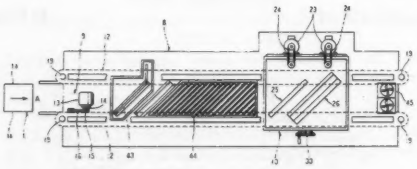
Senichi Yokota, Hachioji, Japan, assignor to Yokota Machinery Co., Ltd., Tokyo, Japan

Filed Dec. 21, 1989, Ser. No. 454,637

Claims priority, application Japan, Dec. 31, 1988, 63-335180; May 31, 1989, 1-139859

Int. Cl.[5] H05K *3/34*

U.S. Cl. 228—180.1 **7 Claims**



1. An automatic soldering method including a provision for progressively moving up a horizontal position of a base board as the base board is transported to be soldered in a direction from a base board entrance side to a soldered base board exit side of a base board transporting path, the method comprising the steps of:

arranging a molten solder jetting nozzle laterally of the base board transporting path in a manner that the nozzle extends inclined with respect to a base board transporting direction in a horizontal plane with a positional variation to be progressively farther from the base board entrance side of the base board transporting path; and

transporting the base board while the base board is inclined in a vertical plane intersecting the base board transporting direction with a positional variation to be progressively lowered in one direction to which the nozzle extends to be progressively farther from the base board entrance side such that a distance between a lower side of the base board and the nozzle is constant all through a length of the nozzle as the base board is transported past over the nozzle.

5,024,371

WELDING PROCESS

Madhav A. Unde, P.O. Box 254474, Sacramento, Calif. 95865

Filed Dec. 26, 1989, Ser. No. 456,934

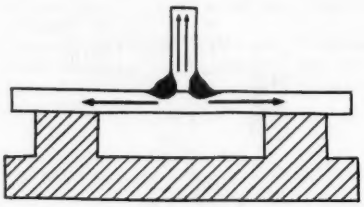
Int. Cl.[5] B23K *37/04*

U.S. Cl. 228—216 **2 Claims**

1. A process for reducing the incidence of cracks and porosity generated during welding operation of metals/alloys—more specifically welds of aluminum or aluminum alloy parts comprising the steps of:

(a) providing stationary back-up support of material having higher conductivity than the base metal/s/ alloys.

(b) the same back-up support material contacting the weld seam in immediate contact and being free from contact with the said surface of base metals/alloys extending to either lateral side of the weld seam thereby providing an isolated transfer path for the heat;



(c) the back-up material having substantial heat-sink capacity;

(d) fusion welding the metal parts with minimal heat flow laterally of the weld seam due to use of the said back-up support.

5,024,372

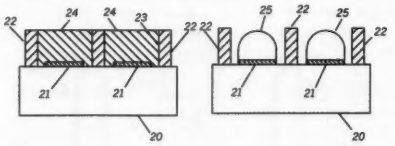
METHOD OF MAKING HIGH DENSITY SOLDER BUMPS AND A SUBSTRATE SOCKET FOR HIGH DENSITY SOLDER BUMPS

Leonard F. Altman, Coral Springs; Jill L. Flaugher, Margate; Anthony B. Suppelsa, Coral Springs, and William B. Mullen, III, Boca Raton, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 292,988, Jan. 3, 1989, abandoned. This application May 9, 1990, Ser. No. 520,995

Int. Cl.[5] H01L *21/60;* H05K *3/34;* B23K *31/02*

U.S. Cl. 228—248 **6 Claims**



1. A method of forming solder bumps comprising the steps of:

applying a thick layer of resist on the substrate

forming wells in the resist by selectively removing portions thereof over solder pads on the substrate

applying solder paste only in the wells to contact the solder pads, and

reflowing the solder paste to form solder bumps on the solder pads.

5,024,373

CONTAINER FOR PULVERIZED AND GRANULAR PRODUCTS, SUCH AS MEDICINES

Leslie L. Riel, Van Alkemadelaan 1056,2597 BJ, The Hague, Netherlands, assignor to Leslie L. Riel; Hendrik van der Tak; Shafiq M. Ghafoerkhan and Power Pack International B.V. i.o., all of The Hague, Netherlands

Filed Mar. 19, 1990, Ser. No. 495,423

Int. Cl.[5] B65D *27/14*

U.S. Cl. 229—68 R **8 Claims**

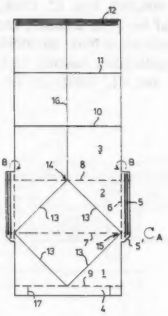
1. Container made up like an envelope, obtained by folding a stamped blank of sheet material and comprising:

a front sheet;

a back sheet connected therewith by means of a first folding line;

a flap having extreme edges and sides connected with the back sheet by means of a second folding line having a center which runs parallel to the first folding line, said flap at least partly overlapping the front sheet;

side strips which are connected with the back sheet by means of longitudinal folding lines perpendicular to said first folding line, the edges of the front sheet being adhered thereto by means of an adhesive path,



wherein said front and back sheets are substantially of the same size, and wherein two pairs of crease lines have been provided in these sheets, which crease lines, after manufacturing of the envelope, substantially extend from the center of the second folding line to points of intersection of the first folding line with the longitudinal folding lines; and

the flap having a slightly adhesive path on the extreme edge thereof.

5,024,374

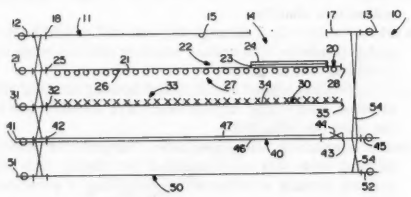
FLYLESS MAILER HAVING TOP SHEET WITH CUTOUT

Robert E. Ashby, Quakertown, Pa., assignor to Moore Business Forms, Inc., Del.

Filed Feb. 15, 1990, Ser. No. 479,704

Int. Cl.[5] B65D *27/06, 27/10*

U.S. Cl. 229—71 **17 Claims**



1. A mailer type business form comprising:

a top ply having a top surface and a bottom surface, and having means defining a cutout therein, said cutout having an area and position comparable to an address area on a piece of mail;

a second, insert, ply underlying said top ply, including said cutout, and having a top surface in contact with the bottom surface of said top ply and a bottom face;

a localized coating of self-imaging material formed on said second ply top surface only in the area thereof overlaid by said cutout;

a third ply cooperating with said top ply to define an outgoing envelope, said second ply overlying said third ply; and

a fourth, insert, ply having a top face thereof in contact with said bottom face of said second ply;

said second ply having a capsule coat on the bottom face thereof, and said fourth ply having a resin coat on the top surface thereof aligned with said capsule coat on said second ply bottom face.

5,024,375

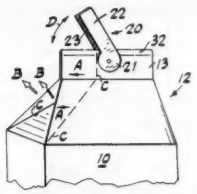
CLOSURE DEVICE FOR RECLOSING A GABLE-TOP CONTAINER

Wright, Christopher B., 2299 Pacific Ave., San Francisco, Calif. 94115

Filed Mar. 19, 1990, Ser. No. 495,109

Int. Cl.[5] B65D *33/16*

U.S. Cl. 229—125.39 **17 Claims**



2. A closure device for use in combination with a gable-top container, of the type having container walls defining a refoldable gable top, the gable top having folded container walls defining a top ridge formed on a top side of the gable top having one openable side of a given length and width and a non-openable side opposite from said openable side, the top ridge being initially sealed and capable of having the one openable side thereof opened such that the gable top of the container can be unfolded on the one openable side into a spout and refolded for reclosure, comprising:

an elongated member having a holding portion and a mounting portion, said holding portion including walls defining an interior channel which has a width corresponding to the width of the top ridge of the container, said interior channel being open on a bottom side of said elongated member adapted to face toward the top ridge, and said mounting portion being formed at one end of said elongated member and being pivotably secured onto the top ridge at an intermediate position thereof adjacent and clear of the one openable side of the top ridge, wherein said elongated member is pivoted upwards to allow the one openable side of the top ridge to be initially opened or reopened, and pivoted downwards to engage the refolded top ridge on the one openable side in a friction fit in the interior channel of the elongated member to securely hold the top ridge closed,

wherein said elongated member has bar-shaped rectangular walls which are spaced apart by the width of the interior channel and have a length matched to the length of the one openable side of the top ridge to be secured.

5,024,376

WEB OF MATERIAL CONSISTING OF (PACK) BLANKS CONNECTED TO ONE ANOTHER

Heinz Focke, Verden, Fed. Rep. of Germany, assignor to Focke & Co., GmbH, Fed. Rep. of Germany

Filed May 23, 1990, Ser. No. 527,604

Claims priority, application Fed. Rep. of Germany, May 23, 1989, 3916756

Int. Cl.[5] B65D *5/66*

U.S. Cl. 229—160.1 **5 Claims**

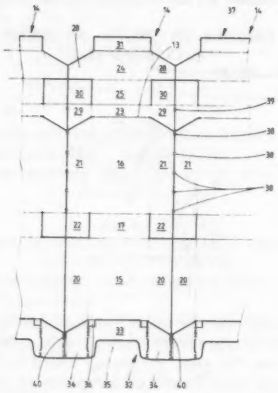
1. Web of material consisting of individual blanks **(14)** for the production of finished hinge-lid packs of the type having an internal collar,

wherein each of the individual blanks **(14)** consists of a pack blank portion and of a collar blank portion **(32)** which is integrally connected to the pack blank portion and which has collar side walls **(34)**;

wherein said blanks are arranged in series, and adjacent pack

blank portions are connected to one another only at selected free blank edges by primary residual connecting webs (38) in the web of material;

wherein adjacent individual blanks (14) are also connected to one another in a region of the collar blank portion (32)



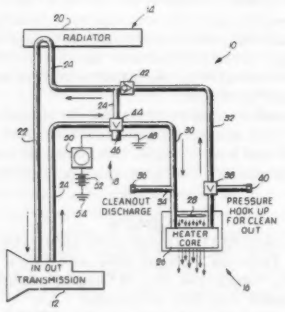
by at least one collar residual connecting web (40) between free mutually confronting edges of adjacent collar side walls (34); and wherein adjacent blank edges are free and disconnected from one another in said web of material except for said primary and collar residual connecting webs.

5,024,377

VEHICLE HEATING SYSTEM

Frank Harrison, P.O. Box 1824, Kansas City, Mo. 64141

Filed Jan. 19, 1990, Ser. No. 467,570
Int. Cl.[5] G05D *23/00*
U.S. Cl. 237—2 A 7 Claims



1. A heating system for a vehicle having a transmission with fluid, the system comprising:

means for cooling the transmission fluid;

heat exchanger means including conduit structure operably coupling said cooling means and transmission with said heat exchanger means for two-way fluid communication therebetween; and

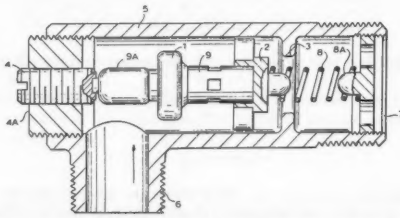
diversion means operably coupling said heat exchanger means with said cooling means and the transmission for selectively diverting transmission fluid when the fluid is placed in the transmission and the temperature of the interior of the vehicle reaches a predetermined minimum level, so that the heated transmission fluid is circulated through said heat exchanger means.

5,024,378

SHUT-OFF VALVE FOR SCALD PREVENTION

Konrad Bergmann; Josef Ems, both of Wittlich, and Hans Nikolayczik, Minheim, all of Fed. Rep. of Germany, assignors to American Standard Inc., New York, N.Y.

Continuation of Ser. No. 451,119, Dec. 14, 1989, which is a division of Ser. No. 406,043, Sep. 12, 1989, Pat. No. 4,917,294, which is a division of Ser. No. 253,859, Oct. 4, 1988, Pat. No. 4,981,261. This application Nov. 26, 1990, Ser. No. 619,185
Claims priority, application Austria, Oct. 18, 1987, 2661/87
Int. Cl.[5] G05D *23/12*
U.S. Cl. 236—93 B 2 Claims



2. An assembly for preventing water exceeding a preselected temperature from exiting a supply line, comprising:

a supply line including a housing, said housing including a front end and a rear end and defining a chamber therein;

an outlet defined by the front end of said housing and in fluid communication with said chamber;

a sanitary valve assembly positioned within said chamber, said valve assembly including a valve seat having a cylindrical opening extending therethrough and a cylindrical valve member having slightly smaller dimensions than said valve seat opening, said valve member being movable between a closed position wherein it is positioned within said valve seat such that a radial clearance is defined between said valve member and said valve seat, and an open position wherein a fluid may freely pass between said valve member and said valve seat;

an expandable, temperature sensitive element positioned within said chamber;

a set screw extending through the rear end of said housing, said expandable, temperature sensitive element being connected to said set screw;

a spring bearing against a wall of said housing and said valve member, said spring urging said valve member towards the open position; and

means connecting said expandable, temperature sensitive element with said valve member for urging said valve element detects a temperature exceeding a preselected value,

said set screw, said expandable, temperature sensitive element, said valve element, said valve seat opening and said spring all being substantially coaxial.

5,024,379

VARIABLE CAPACITY HEATING APPLIANCE

Daniel J. Dempsey, Carmel, Ind., assignor to Carrier Corporation, Syracuse, N.Y.

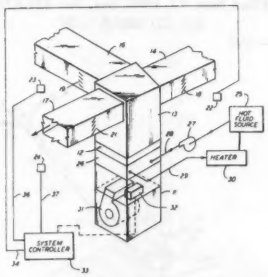
Continuation of Ser. No. 260,974, Oct. 21, 1988, abandoned. This application Aug. 21, 1989, Ser. No. 396,789
Int. Cl.[5] F24H *3/06*
U.S. Cl. 237—16 4 Claims

1. In a heating system of the type having a heater for selectively adding heat to a first fluid for maintaining its temperature at a predetermined level, and a heat exchanger connected thereto for receiving a flow of said first fluid at said predeter-

mined temperature and returning a flow thereof at another cooler temperature, an improved temperature control system comprising:

a fan for circulating a second fluid over said heat exchanger to facilitate the transfer of heat to said second fluid for delivery to a distribution system downstream thereof, said fan being capable of operating over a continuous and wide range of speeds;

means for determining, over a continuous range, the heating load requirements of said downstream distribution system; and



means for varying the speed of said fan in response to said heating load requirements, wherein said means for determining the heating load requirements comprises:

at least one thermostat for determining the thermostat error in said downstream distribution system; and

a controller for calculating the needed change in system capacity as a function of said thermostat error, and for further determining a new system capacity as a function of an old system capacity modified by said needed capacity change.

5,024,380

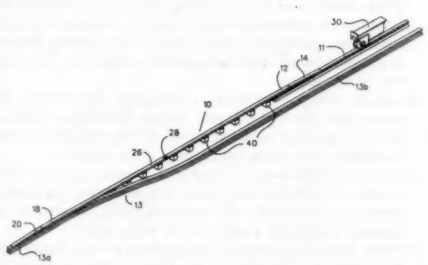
METHOD AND APPARATUS FOR CONTINUOUS WELDED RAIL

H. Anthony Newman, Chesterton, Ind., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Jan. 5, 1990, Ser. No. 461,552

Int. Cl.[5] E01B *23/00*

U.S. Cl. 238—218 **8 Claims**



1. A method of replacing old rail with new continuous welded rail where rolling stock is parked on the trackway at a location which prevents further removal of old rail and placement of new rail said method comprising the steps:

a) removing the old rail up to a location near the parked rolling stock,

b) placing new continuous welded rail along the trackwork where the said old rail has been removed and fastening the said new continuous welded rail to the trackwork up to a location near said parked rolling stock,

c) bending the remaining unfastened portion of said new continuous welded rail to extend substantially parallel along side of the remaining old worn rail on which said rolling stock is parked,

d) providing a temporary bridge to span the distance between the said remaining old rail and new fastened continuous welded rail,

e) transferring said parked rolling stock from said remaining old rail, across said temporary bridge and onto said fastened new continuous rail,

f) removing said temporary bridge,

g) removing remaining said old worn rail, and

h) bending said remaining unfastened new continuous welded rail into alignment with, and along the centerline of, said fastened new continuous welded rail, and fastening said remaining unfastened new continuous welded rail to the said trackwork.

5,024,381

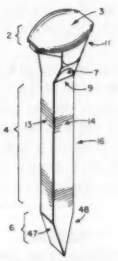
ACTIVE RAILROAD SPIKE AND TIE PLATE INTERCONNECTION THEREFOR

Richard J. Stafford, III, Charlotte, N.C., assignor to Stafford Rail Products, Inc., Lancaster, S.C.

Filed Mar. 10, 1989, Ser. No. 321,853

Int. Cl.[5] E01B *13/00*

U.S. Cl. 238—367 **5 Claims**



1. In a railroad spike, intended for securing a tie plate to a tie, having a longitudinally elongated shank member with a top end, a bottom end, flat front, rear, left and right side walls, a head member proximate the top end of said shank member, a head member lower surface that extends transversely and overhangs said front wall, and a wedge-like bottom end with flat front and rear surfaces, the improvement which comprises a pair of wedge shoulders that extend upwardly and outwardly at an angle of approximately twenty-three degrees from the left and right side wall portions of the spike shank and connect with a reinforced portion of the spike that is below and proximate to the head member, the reinforced portion of said spike comprising a left and right side portion respectively extending substantially vertically above the left and right wedge shoulders, each wedge shoulder comprising substantially planar portions that define a wedge therebetween with at least one lateral dimension greater than an opening dimension between left and right sides of a tie plate rail hole, whereby upon driving of said spike into the tie plate rail hole, an inclined plane of contact is defined between said wedge shoulders and interior leading edge surfaces of the tie plate rail hole such that an increasing swaging action, occurring between said wedge shoulders and the edge surfaces of the tie plate rail hole, sufficient to prevent the head member lower surface from contacting, and the reinforced portion of the spike from contacting, an upper flange surface of the tie plate, is resisted by the left and right side portions of said reinforced portion of said spike.

5,024,382

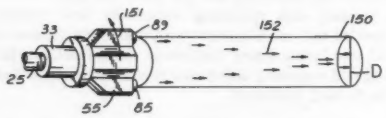
SELF-ROTATING NOZZLE AND METHOD OF USE

Forrest A. Shook, Fenton, and Terry L. Henshaw, Battle Creek, both of Mich., assignors to NLB Corp., Wixom, Mich.

Continuation-in-part of Ser. No. 175,805, Mar. 31, 1988, Pat. No. 4,821,961. This application Nov. 18, 1988, Ser. No. 273,396

Int. Cl.[5] B05B *3/06, 9/01*

U.S. Cl. 239—11 11 Claims



1. A method of cleaning a surface to be cleaned by a high-velocity rotational jet of fluid, comprising:

mounting a rotating head upon a fixed shank in such a way that it is freely rotatable upon the fixed shank;

forming passages through the fixed shank, through the rotating head and into two nozzles attached to the head;

canting the nozzles with respect to a longitudinal axis; and

allowing high-pressure fluid to go through said passages in the shank into said passages in the rotating head, and out the fluid nozzles, thus changing the fluid into a high-velocity fluid with both a longitudinal component and a transverse component, the tranverse component being converted as a reactive force to the rotating head, causing the rotating head to rotate, the mounting of the rotating head upon the shank allowing the rotating head to rotate at a speed that approximates the transverse component of the fluid velocity:

the rotation of the rotating head at a speed that approximates the transverse component of the fluid velocity causing the rotating head to rotate in the opposite direction as the fluid and to cancel out the transverse component of the fluid velocity, thus creating a fluid jet that is nearly longitudinal and results in a nearly cylindrical jet of water being applied to the surface to be cleaned.

5,024,383

VEHICLE WITH A RESERVOIR INCORPORATED IN A STRUCTURAL ELEMENT OF THE VEHICLE BODY

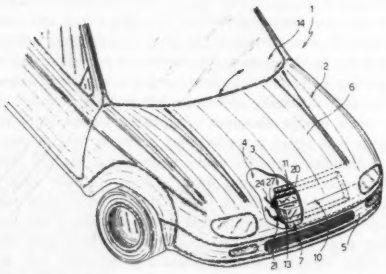
Lorenzo Vaschetto, Collegno, and Luigi Fazio, Turin, both of Italy, assignors to 501 Fiat Auto S.P.A., Turin, Italy

Filed Sep. 11, 1989, Ser. No. 405,312

Claims priority, application Italy, Sep. 13, 1988, 67812 A/88

Int. Cl.[5] B60R *16/08;* B60S *1/46*

U.S. Cl. 239—284.1 11 Claims



1. A vehicle body, comprising:

(a) load-bearing means forming a portion of the vehicle body and contributing to the overall structure thereof;

(b) said load-bearing means including reservoir means for containing a fluid therein;

(c) said load-bearing means including a generally hollow cross-member defining therein said reservoir means; and

(d) said cross-member being disposed adjacent the front of a vehicle engine compartment and adjacent the front bumper of the vehicle.

5,024,384

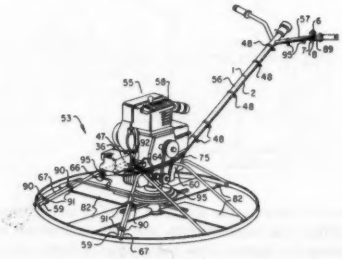
IMPROVED SPRAY APPARATUS FOR CONCRETE FINISHING MACHINES

Gerald W. Redmon, and Tina L. Redmon, both of 2000 W. Arkansas La., Lot 77, Arlington, Tex. 76013

Filed Nov. 13, 1989, Ser. No. 437,073

Int. Cl.[5] B05B *9/00*

U.S. Cl. 239—289 4 Claims



1. An improved water spray apparatus for attachment to a concrete finishing machine having a handle bar, a motor, a frame, and a plurality of front braces, the improved apparatus comprising:

an electric pump having an inlet and an outlet;

a liquid reservoir having an inlet, an outlet, and a top cover;

a battery supported in a battery case holder and having positive and negative terminals, said battery case holder having a drainage hole;

an electric switch attached to the handle bar of the finishing machine,

a support universal bracket having a plurality of holes, said holes receiving bolts to secure the support bracket to the frame of the finishing machine;

supply tubing interconnecting the reservoir outlet and the pump inlet and extending from the pump outlet to a pair of spray outlets, said supply tubing being attached along the front braces of the finishing machine by clamps, said spray outlets being disposed close to the surface being finished to prevent winds from substantially disrupting the direction of the spray;

electrical wiring electrically connecting the battery, the pump, and the switch, said wiring including a pair of bullet connectors at the positive and the negative battery terminals to facilitate recharging of the battery;

wherein the battery case holder is secured to the back of the support bracket and the reservoir is secured to the front of the support bracket, said reservoir being secured to the support bracket by a plurality of bolts, and

wherein upon depression of the electrical switch, liquid from the reservoir is pumped to the spray outlets to spray the surface being finished.

5,024,385

INTERNAL COMBUSTION ENGINE FUEL SUPPLY SYSTEM

Jeffrey A. Olson, Vernon Hills, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

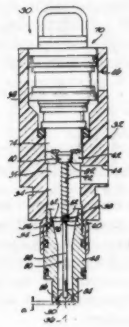
Filed Jan. 11, 1990, Ser. No. 463,439

Int. Cl.[5] B05B *7/12*

U.S. Cl. 239—410 32 Claims

1. A fuel supply apparatus comprising a housing having

therein a passageway adapted to communicate with a combustion chamber and including a valve seat, and a bore communicating with said passageway and adapted to communicate with a source of fuel under pressure, a valve member including a valve surface and a portion spaced from said valve surface at a fixed distance and partially extending into said bore to define therebetween a fuel flow controlling orifice, said valve member being movable relative to said housing between a closed



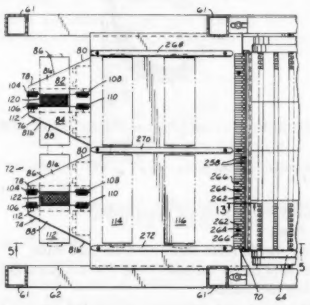
position wherein said valve surface engages said valve seat so as to close said passageway to the combustion chamber and said portion extends a first distance into said bore, and an open position wherein said valve surface is spaced from said valve seat so as to open said passageway to the combustion chamber and said portion extends a second distance less than said first distance into said bore, and means for adjusting the rate of fuel flow through said orifice and past said portion.

5,024,386

TIRE CONVERTING APPARATUS AND METHOD

Alvin L. Morris, Warren, Mich., assignor to PFM, Inc., Detroit, Mich.

Filed May 18, 1989, Ser. No. 354,148
Int. Cl.[5] B02C *19/12*
U.S. Cl. 241—3 **18 Claims**



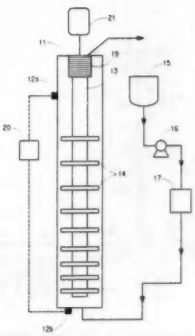
1. The method of converting tires comprising the steps of:
debeading the tires;
cutting each tire diametrically into at least two segments;
commencing at one end of each segment, spreading the sidewalls apart while the segment;
while holding the segment flattened, shredding it progressively from one end to the other; and
recovering the shredded pieces for further use.

5,024,387

ON LINE CONTROL METHOD TO DETERMINE MEDIA FLUIDIZATION IN A MEDIA MILL

An-Gong Yeh, Broomall, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 384,814, Jul. 25, 1989, abandoned. This application Apr. 26, 1990, Ser. No. 515,697
Int. Cl.[5] B02C *25/00*
U.S. Cl. 241—21 **4 Claims**



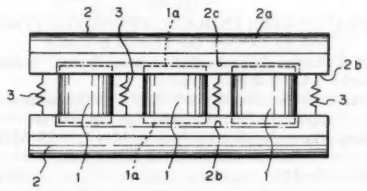
1. In a continuous method of grinding, deagglomerating or dispersing particulate solids in a liquid, said method comprising: introducing the liquid containing the particulate solids into a vessel containing grinding media; grinding the particulate solids in the liquid by forcing the liquid at a flow rate through the grinding media while rapidly moving the grinding media; and separating the liquid containing the particulate solids from the grinding media as it leaves the vessel; wherein the improvement comprises maintaining the media in a state of fluidization by monitoring a differential pressure measurement across some length of the vessel, the differential pressure being measured by at least two pressure sensors, and adjusting the liquid flow rate accordingly.

5,024,388

STONEWORK CRUSHER

Katsuhiko Kaneko, and Minoru Nishida, both of Kumamoto, Japan, assignors to Nishimatsu Co., Ltd. and Tokin Corporation, both of, Japan

Filed Dec. 6, 1989, Ser. No. 446,754
Claims priority, application Japan, Dec. 9, 1988, 63-160262[U]
Int. Cl.[5] B02C *19/00;* **E21C** *37/00*
U.S. Cl. 241—301 **13 Claims**



1. An improved stonework crusher comprising
at least one insert head made of shape memory alloy,
a pair of abutments attached at opposite outer faces of said at least one insert head,
means for connecting said pair of abutments while allowing for a change in distance between said abutments, and
means for heating said at least one insert head.

5,024,389
CONVEYING APPARATUS FOR A TEXTILE WINDING MACHINE

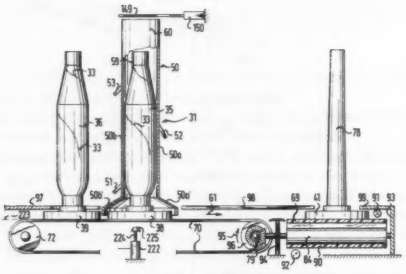
Hans Grecksch, and Dietmar Engelhardt, both of Monchen-Gladbach, Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Moenchengladbach, Fed. Rep. of Germany

Filed Dec. 26, 1989, Ser. No. 456,355

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1988, 3843553

Int. Cl.[5] B65H *67/02, 67/06*

U.S. Cl. 242—35.50 A **12 Claims**



1. In a textile machine of the type having a plurality of independently movable tube support members for individually supporting tubes in generally upright dispositions, an unwinding device for unwinding, at an unwinding location, packages of textile material such as yarn or the like wound on tubes supported on the tube support members, a yarn end loosening assembly disposed for acting on the periphery of a package at the unwinding location for preliminary loosening a yarn end on the package to facilitate unwinding of the yarn therefrom, a delivery assembly for delivering the tube support members to a preliminary location for feeding to the unwinding device, a discharge assembly for transporting tube support members from a discharge location to a further handling location, a tube support member conveying apparatus, comprising:

conveying means for conveying the tube support members along a cross path extending from the preliminary location through the unwinding location to the discharge location, said conveying means supporting a respective tube support member at the unwinding location in a predetermined disposition upstanding from said conveying means; and

tilt means selectively extendible into a position to effect tilting of said respective support member at an inclination to said upstanding disposition, whereby the yarn on the tube is moved into contact with the yarn end loosening assembly for facilitating loosening of the yarn end from the packages.

5,024,390
APPARATUS WITH ENDLESS SCREWS FOR FORMING FLAT LOOPS OF TEXTILE YARN

Robert Enderlin, Morschwiller-Le-Bas, France, assignor to Superba S.A., Mulhouse, France

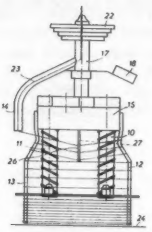
Continuation of Ser. No. 859,659, May 5, 1986, abandoned. This application Dec. 21, 1990, Ser. No. 633,158

Claims priority, application France, May 7, 1985, 85-07062

Int. Cl.[5] B65H *51/20;* **D02G** *1/20*

U.S. Cl. 242—47 **16 Claims**

1. Apparatus for forming flat loops of textile yarn and depositing them on a moving conveyor belt, comprising a conveyor belt, at least two endless screws, means for driving said endless screws, at least two members for supporting and guiding yarn loops, said support and guide members being disposed on either side of said endless screws outwardly thereof, two deviating rods, said deviating rods being disposed in a plane parallel to the axes of said endless screws and equidistant therefrom, said plane being perpendicular to a plane defined by said support and guide members and perpendicular to a surface of said conveyor belt, a driven rotating arm arranged to rotate and coil yarn around said endless screws, said support and guide members and said deviating rods, said support and guide members being configured to permit inverting the yarn loops between the ends of said endless screws and a zone of deposition of said loops on said conveyor belt surface, and means for inverting the yarn loops comprising a surface on said conveyor belt adapted to provide friction for driving the yarn and means for displacing said conveyor belt surface at a speed greater than the speed of displacement of said yarn loops on said support and guide members.



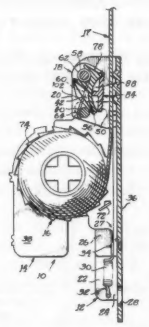
5,024,391
RETRACTOR WITH AUXILIARY BRAKING MECHANISM

James L. Zygutis, Frankfort, Ill., and Gerald A. Doty, Crown Point, Ind., assignors to Occupant Safety Systems, Inc., Olympia Fields, Ill.

Continuation-in-part of Ser. No. 341,440, Apr. 21, 1989. This application Feb. 22, 1990, Ser. No. 484,499

Int. Cl.[5] A62B *35/00;* **B65H** *75/48*

U.S. Cl. 242—107.200 **13 Claims**



1. A safety belt retractor comprising:

a fixed base;

a braking mechanism supported on said base;

a frame supported on said base for cooperation with said braking mechanism;

a spring-biased reel assembly supported on the frame, said reel assembly having a reel supported for rotation in protractive and retractive directions, and an inertial locking mechanism for selectively preventing protractive rotation of said reel;

a belt made of filaments wound on said reel and extending past said braking mechanism for selective engagement by said braking mechanism; said belt having a length of webbing;

said braking mechanism having a brake shoe movable be-

tween an inactive position, wherein said webbing is movable past said braking mechanism in a longitudinal direction; and a braking position wherein a first side of the belt is engaged and constrained against protraction by said braking shoe;

said brake shoe having teeth and a non-compressible surface for engaging the first side of the belt with the teeth going into webbing between filaments; and

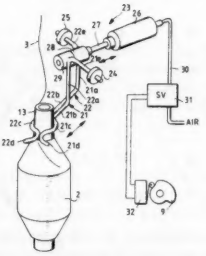
an elastomer pad positioned on said base to engage an opposite side of the belt and having a compressible surface into which filaments of the belt make impressions at high loads and a coefficient of friction of at least 0.5 and a tensile strength to withstand tearing when gripping and exerting a substantial restraining force on the opposite side of the belt.

5,024,392

KINK PREVENTING DEVICE FOR WINDER

Hiroshi Uchida, Oumihachiman, and Norio Kubota, Kyoto, both of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Jan. 18, 1990, Ser. No. 466,868
Claims priority, application Japan, Jan. 25, 1989, 1-6532[U]
Int. Cl.[5] B65H *49/02, 59/02*
U.S. Cl. 242—128 **9 Claims**



1. A kink preventing device for preventing occurrence of a kink in a yarn drawn out from a yarn supply bobbin of a winder, comprising a pair of kink bars supported for opening and closing movement with the yarn supply bobbin interposed therebetween and each having a contacting portion which is arcuately extended along an outer peripheral portion of the bobbin, and having a free end and a kink bar opening and closing means for moving said kink bars to close until the contacting portions thereof are abutted with each other to connect said kink bars in a ring-like configuration to each other.

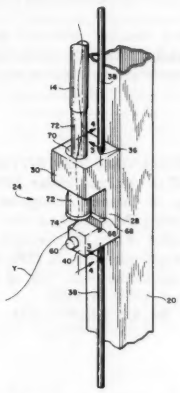
5,024,393

YARN THREADING APPARATUS FOR TUBE-TYPE TEXTILE YARN CREELS

Alan Gutschmit, Troy, N.C., assignor to Alandale Industries, Inc., Troy, N.C.

Filed Apr. 27, 1990, Ser. No. 516,090
Int. Cl.[5] B65H *49/14*
U.S. Cl. 242—131 **15 Claims**

1. In a textile yarn creel having a plurality of yarn package support locations and a respective plurality of yarn transport tubes, each tube extending from an entrance end disposed in association with a respective one of said package support locations to an exit end disposed at a remote yarn delivery location, the improvement comprising apparatus for threading a respective yarn through each yarn transport tube, said yarn threading apparatus including means for generating a moving gaseous stream, and a plurality of selectively openable and closeable fluid-transmitting valve means, each valve means being operatively associated with a respective one of said tubes for fluid communication interiorly therewith in the open condition of the valve means and each valve means being operatively communicated with said generating means for selectively directing a gaseous stream to flow through the respectively associated tube in the open condition of the valve means for entraining a yarn at the entrance end of the tube to thread the yarn through the tube, said plurality of valve means being



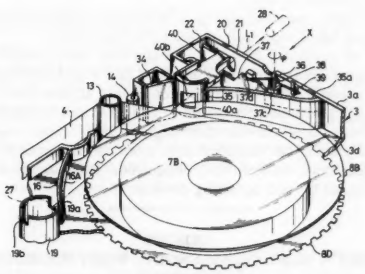
arranged in groups each comprising a subplurality of said valve means, said generating means being operatively communicated with each said group of valve means to direct a common gaseous stream in series to the individual valve means in the respective group.

5,024,394

TAPE CASSETTE

Kazuo Ozawa, Tokyo, and Masanori Sato, Miyagi, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 14, 1989, Ser. No. 393,549
Claims priority, application Japan, Sep. 12, 1988, 63-228174
Int. Cl.[5] G11B *23/06*
U.S. Cl. 242—198 **13 Claims**



1. An improved tape cassette of the type having an upper cassette half and a lower cassette half, and a light emitting element insertion portion located therebetween, a tape-shaped medium having a light transmissive portion wound between the upper and lower cassette halves and surrounding the light emitting element insertion portion, and a light receiving window through a side wall of the cassette so as to oppose the light emitting element insertion portion across the tape-shaped medium, whereby when the tape cassette is loaded into a recording and reproducing apparatus, a light emitting element can be inserted into the light emitting element insertion portion and a light receiving element can be located outside of the light receiving window, to thereby establish a light path therebe-

tween and allow detection of the predetermined portion of the tape-shaped medium, wherein the improvement comprises:

(a) light-shielding ribs, one of the ribs extending up to a substantially central portion of the cassette side wall having the light receiving window, the ribs being formed between the upper cassette half and the lower cassette half on opposite sides of the light path extending from the light receiving element insertion portion to the light receiving window; and

(b) a tunnel piece member provided between the light-shielding ribs and substantially extending to the side wall having the light receiving window so as to surround the light path.

5,024,395

STEPPING MECHANISM FOR ROTARY MOTIONS

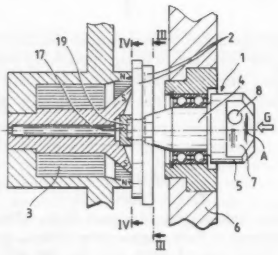
Walter Kranz, Taufkirchen, and Heinz Tillmann, Riemerling, both of Fed. Rep. of Germany, assignors to Messerschmitt Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 144,327, Jan. 14, 1988, abandoned. This application Jun. 6, 1989, Ser. No. 363,342

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1987, 3702240; Jun. 6, 1988, 3819190

Int. Cl.[5] F42B *15/033*

U.S. Cl. 244—3.22 **21 Claims**



1. A stepping mechanism for rotary motions, which comprises:

(a) a switching wheel including at least one wheel-side stop,

(b) means for providing a continuous drive force on said switching wheel,

(c) at least one pawl arranged for operative engagement with said wheel-side stop of said switching wheel,

(d) an actuating device for controlling said operative engagement between said pawl and said wheel-side stop, and

(e) a displaceable brake element having at least one run-up edge positioned proximate to said pawl and arranged such that said wheel-side stop engages said run-up edge and displaces said brake element prior to said operative engagement between said wheel-side stop and said pawl caused by said actuating device.

5,024,396

AIR OR SUBMARINE ENGINE WITH IMPROVED CONTOUR

Pierre M. Guevel, Chateauneuf de Grasse, and Philippe R. Bardey, Mougins, both of France, assignors to Principia Recherche Developpement SA, Valbonne, France

Continuation of Ser. No. 220,909, Jul. 19, 1988, abandoned, which is a continuation-in-part of Ser. No. 876,764, Jun. 20, 1986, abandoned. This application Feb. 26, 1990, Ser. No. 489,746

Int. Cl.[5] B64C *3/14;* **B63G** *8/00*

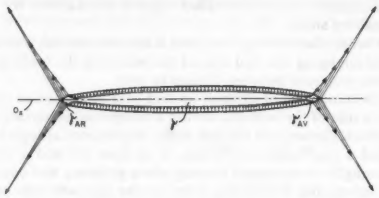
U.S. Cl. 244—35 R **3 Claims**

1. A reduced-drag, axially symmetrical submarine hull having

a rounded, tapered bow portion (AV);

a rounded, tapered stern portion (AR); and

a rounded, central portion joining said bow and stern portions and tapered, for drag minimization, along a curve



defined by a Fredholm integral equation of the second kind.

5,024,397

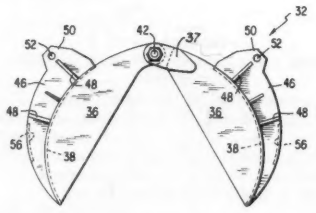
CLAMSHELL ATTACHMENT FOR LOG GRAPPLE

James C. Edwards, North Bend, and Edward E. Pritchard, Reedsport, both of Oreg., assignors to International Paper, Purchase, N.Y.

Filed Feb. 14, 1990, Ser. No. 479,771

Int. Cl.[5] B66C *3/02*

U.S. Cl. 294—68.23 **10 Claims**



1. A clamshell attachment for a log grapple, the attachment adapted to be added to a log grapple having a pair of pivoted jaws to convert the log grapple into a clamshell grapple for scooping bulk material, the attachment including a pair of concave-convex scoops, said scoops having aligned hinges which couple upper portions thereof of each scoop together about an upper common axis so that the scoops are hinged together at the upper portions thereof, a convex side of each scoop provided with means for coupling a respective said log grapple jaw thereto, wherein the convex side of each scoop is also provided with a pocket to receive a portion of said respective jaw of the log grapple.

5,024,398

OFFICE MODULE FOR PASSENGER AIRCRAFT

Thomas R. Riedinger, Mercer Island, and Thomas H. White, Issaquah, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jun. 28, 1989, Ser. No. 372,535

Int. Cl.[5] B64D *11/00*

U.S. Cl. 244—118.5 **15 Claims**

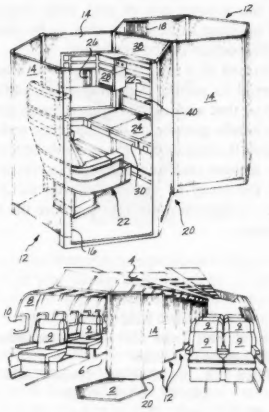
1. An office module for use in an aircraft passenger cabin having a floor, a ceiling, and an aisle, said module comprising:

sidewalls positionable to define an office space adjacent to said aisle; said sidewalls being dimensioned to extend downwardly at least substantially to said floor of the cabin and upwardly a distance sufficient to screen said space from persons outside said space, and to be spaced from said ceiling a distance sufficient to allow circulation of air into and out from said space; said sidewalls having an opening therein to permit entry into and exit from said space from and to said aisle; and said sidewalls defining a recess to permit a person to step out of said aisle into said

recess to allow a cart or another person to pass without intruding into said office space;

a seat mountable on said floor inside said space; and

a desk top carried by inside portions of said sidewalls and positioned to be used by an occupant of said seat;



said sidewalls and said space being configured, and said seat and said desk top being positioned, to maximize elbow room and leg room for said occupant within a predetermined floor area occupied by said space.

5,024,399

FRAME MADE OF A COMPOSITE MATERIAL, ESPECIALLY FOR THE FUSELAGE OF AN AIRCRAFT, AND ITS METHOD OF PRODUCTION

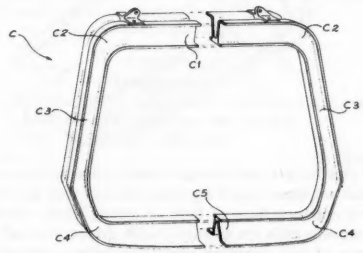
Henri Barquet, Chateauneuf les Martigues; Pierre-Paul Negroni, Marseilles, and Bernard Plissonneau, Aix en Provence, all of France, assignors to Societe Nationale Industrielle et Aetospatiale, Paris, France

Filed Jun. 2, 1989, Ser. No. 360,255

Claims priority, application France, Jun. 8, 1988, 88 07638

Int. Cl.[5] B64C *1/10*

U.S. Cl. 244—119 **14 Claims**



1. Frame made of a composite material for a working hull, especially for the fuselage of an aircraft, wherein said frame has, at least in a part of its length, a monolithic structure constituted by a profile made of a composite stratified material formed of fibers with high mechanical resistance, said fibers being pre-impregnated by a hardened synthetic resin, said profile having in section an internal flange, two external half-flanges parallel to the internal flange and two webs connecting the internal flange to each external half-flange, the internal flange and the external half flanges mainly being constituted by laps of unidirectional fibers extending longitudinally without discontinuity on the whole length of the frame inside the profile, and the webs of the profile being formed by laps of fabrics made up of multidirectional fibers, these laps of fabrics covering the internal flange and the external half-flanges to connect the latter.

5,024,400

RELEASING DEVICE FOR A PARACHUTE

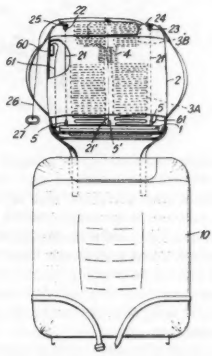
Helmut Cloth, 4790 Paderborn, Riemekester, 97a, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 164,152, Mar. 4, 1988, Pat. No. 4,858,856. This application May 11, 1989, Ser. No. 350,376

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1987, 3707294

Int. Cl.[5] B64D *17/70*

U.S. Cl. 244—147 **14 Claims**



1. A releasing device for a parachute which is in a state ready for use, folded and disposed in a receptacle and held together by a securing member against the force of an unholding preloaded spring, said releasing device having means for disconnecting said securing member and control means for actuating said disconnecting means at predetermined conditions, wherein said disconnecting means comprises a breaking device for said securing member which is located in a container and an energy storage in the container and dischargeable in response to the electrical trigger signal to release said securing member by the force of the energy discharged, the energy acting on said disconnecting means is such a way that said securing member is either destroyed or released, wherein at least a part of the securing member consists of a combustible material which is the energy storage and a triggering device connected to at least part of the securing member for producing the trigger signal and comprising a cable for carrying an electic current from an ignition cable.

5,024,401

CONTROL APPARATUS FOR QUAD-LINE STUNT KITES

Hiroshi Nakashima, 1503 N. Hayden Island Dr., #20, Portland, Oreg. 97217

Filed Jun. 8, 1990, Ser. No. 535,338

Int. Cl.[5] B64C *31/06*

U.S. Cl. 244—155 A **5 Claims**

1. Apparatus to controlling quad-line stunt kites comprising:

a first handle member having a top portion, an intermediate portion and a bottom portion;

a second handle member having a top portion, an intermediate portion and a bottom portion;

means for attaching a first flexible line to the top portion of said first handle member;

means for attaching a second flexible line to the bottom portion of said first handle member;

means for attaching a third flexible line to the top portion of said second handle member;

means for attaching a fourth flexible line to the bottom portion of said second handle member;

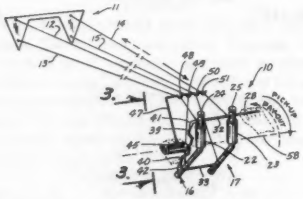
first connecting means for selectively interconnecting the first portion of the first handle member with the first portion of the second handle member;

second connecting means for selectively interconnecting the second portion of the second handle member;

an axle having an axis of rotation;

means for attaching said axle to said first and second connecting means;

crank means attached to said first connecting means and adapted to be grasped with one hand;



means for permitting said axle to be grasped with a person's other hand whereby rotation of said first and second handle members and said first and second connecting means about said axis is accomplished by a cranking motion with said one hand and whereby such rotation causes said first, second, third and fourth lines to wind around said first and second connecting means wherein said axle grasping means comprises a tubular member rotatably disposed on said axle whereby said axle rotates inside of said tubular member; and,

a guide means attached to said tubular member for guiding said first, second, third and fourth lines onto or off of said first and second connecting means as said crank means is rotated around said axis; including first, second, third and fourth partial loops in said guide means for receiving first, second, third and fourth lines respectively.

5,024,402

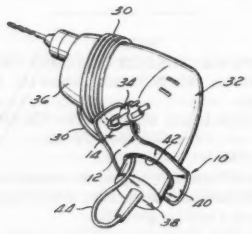
CORD RESTRAINT

Leo F. Hamel, 11103 Moreno Ave., Lakeside, Calif. 92040

Continuation of Ser. No. 464,997, Jan. 16, 1990, abandoned, which is a continuation of Ser. No. 370,172, Jun. 20, 1989, abandoned, which is a continuation of Ser. No. 800,894, Nov. 21, 1985, abandoned, which is a continuation of Ser. No. 546,978, Oct. 31, 1983, abandoned. This application May 15, 1990, Ser. No. 524,336

Int. Cl.[5] F16L *3/00*

U.S. Cl. 248—52 **7 Claims**



1. The combination of an electrical appliance and a device for retaining an electrical cord in a stowed configuration upon the appliance comprising:

an electrical appliance having a handle portion and an electrical cord extending outwardly from said handle portion;

an elongate strap having a first end and a second end;

a first aperture formed adjacent said first end of said strap having an inner diameter sized to permit said first aperture to be resiliently stretched to extend over a plug end of said cord and be retained at desired axial positions along the length of said cord; and

a second aperture, larger than said first aperture, formed adjacent the second end of said strap and defining an enlarged opening sufficient in size to be extended over said handle portion of the appliance;

said strap formed of a sufficiently resilient, readily stretchable material to permit said strap to be initially, axially stretched so that said second aperture may be positioned over said handle portion of the appliance and capture the cord against the handle portion and subsequently be maintained in tension resulting solely from the internal resiliency of the strap to return towards its original non-stretched configuration to tightly secure the cord against the appliance.

5,024,403

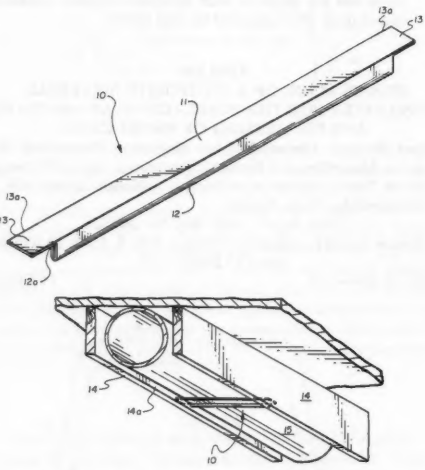
PIPE HANGER

Jerry B. Carlston, Salt Lake City, Utah, assignor to Lynn S. Billeter, Salt Lake City, Utah

Filed Feb. 16, 1990, Ser. No. 481,905

Int. Cl.[5] F16L *3/00*

U.S. Cl. 248—57 **3 Claims**



1. A pipe hanger comprising a straight plate having opposite ends that are spaced apart a greater distance than the distance between opposing faces of floor or ceiling joists, which said plate opposite ends are arranged to be driven into and along the grain of said opposing joist faces by an application of oppositely directed forces to said opposite plate ends; a leg secured to the undersurface of said plate that extends at approximately a right or normal angle therefrom and is of a length to closely fit between said joist opposite faces; and the plate and leg are formed from a single flat, rectangular section of a thin gauge material whose opposite ends are notched and the said material is folded longitudinally at approximately a right angle on line with aligned sides of which notches, and said folded portion is then again folded longitudinally upon itself to where said folded portion edge engages the undersurface of said plate, forming said leg.

5,024,404

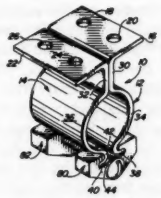
PIPE CLAMP FOR OVERHEAD SPRINKLER HEADS AND THE LIKE

Estus E. Ballard, 6382 Bayhill Dr., Abilene, Tex. 79606

Continuation-in-part of Ser. No. 110,351, Oct. 19, 1987, Pat. No. 4,834,186. This application Apr. 6, 1989, Ser. No. 334,309

Int. Cl.[5] F16L *3/00*

U.S. Cl. 248—62 **29 Claims**



1. A pipe clamp for engaging a pipe supporting an overhead sprinkler head, said pipe clamp comprising in combination:

(a) first and second pipe clamp halves for engaging and gripping the pipe, each of said clamp halves including a distal end and a proximal end;

(b) means disposed at the distal end of each of said clamp halves or anchoring said pipe clamp;

(c) a terminal end disposed at the proximal end of each of said clamp halves, each of said terminal ends being defined by a single fold extending across the respective one of said clamp halves;

(d) a pair of oppositely tapering ramps disposed at said terminal end of each of said clamp halves and proximally of said single fold, each pair of said oppositely tapering ramps including a first ramp tapered in one direction and a second ramp tapered in the opposite direction;

(e) first wedge means being C shaped in cross section and disposed upon the pair of said tapering first ramps for drawing the proximal ends of said clamp halves toward one another to clamp the pipe disposed between said clamp halves;

(f) second wedge means being C shaped in cross section and disposed upon the pair of said tapering second ramps for drawing the proximal ends of said clamp halves toward one another to clamp the pipe disposed between said clamp halves; and

(g) means interconnecting said first and second wedges for translating said first and second wedges in concert toward and away from one another to draw and to loosen, respectively, said pipe clamp about the engaged pipe.

5,024,405

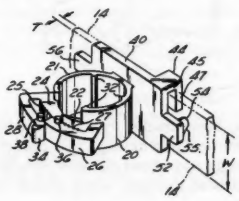
PIPE CLAMP

Robert H. McGuire, 991 S. Rutgers Cir., Anaheim, Calif. 92807

Filed May 12, 1989, Ser. No. 351,052

Int. Cl.[5] F16L *3/08*

U.S. Cl. 248—73 **28 Claims**



1. A pipe clamp, comprising:

a base having lugs adapted to engage with a support bar in a manner to couple said base with said bar and prevent rotation of said base relative to said bar; and

a pipe gripper affixed to said base, said gripper being sized to surround a substantial portion of a pipe, said gripper including a fork having a guide prong spaced from a securing prong, and a tongue being sized to secure between said guide prong and said securing prong.

5,024,406

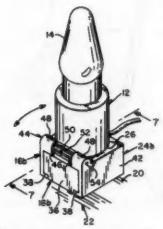
DEVICE FOR HANGING OUTDOOR CHRISTMAS LIGHTS

Raymond H. Ketcham, 169 Baur St., North Babylon, N.Y. 11704

Filed Jan. 31, 1990, Ser. No. 473,621

Int. Cl.[5] F21V *21/00*

U.S. Cl. 248—149 **3 Claims**



1. A hanging outdoor christmas light holder comprising:

a) a lamp socket fixture;

b) a removably attaching member having a first component that is permanently attachable to a static structure on a building;

c) a second mating component that is carried on underside of the lamp socket fixture so that the lamp socket fixture can be quickly and simply removably attached thereto; and

d) means for adjustably affixing one top edge of said second component of said removably attaching member to one side of the underside of the lamp socket fixture so that the lamp socket fixture can be angularly positioned with respect to said removably attaching member, wherein said adjustably affixing means includes:

i) said second component of said removably attaching member having a pair of spaced apart slots extending inwardly from the top edge thereof;

ii) a pair of bosses each formed on the top edge of said second component of said removably attaching member between one of said slots and corner thereof;

iii) an upwardly extending tooth formed on the top edge of said second component of said removably attaching member between said slots so that said tooth will be flexible;

iv) a fixed gear-shaped part affixed to the one side of the underside of the lamp socket fixture so as to fit between said bosses to engage with said tooth; and

v) a shaft to extend through said bosses and said fixed gear-shaped part so that said fixed gear-shaped part on the lamp socket fixture can pivot thereabout allowing said tooth to adjustably engage with said fixed gear-shaped part for holding the lamp socket fixture in any angular position.

5,024,407

ADJUSTABLE SUPPORT FOR LOUDSPEAKER

John E. Bartley, Greenfield, Wis., assignor to Waukesha Specialties & Fabricators, New Berlin, Wis.

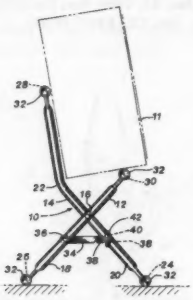
Filed Jul. 30, 1990, Ser. No. 560,412

Int. Cl.[5] A47B *97/00*

U.S. Cl. 248—164 **3 Claims**

1. A support for holding a loudspeaker in an elevated and tilted position comprising a pivotable X-shaped frame formed of two legs pivotally connected together by a pivot pin at a point equal in distance from the respective bottom ends of said

legs; the upper portions of said legs being of unequal length, with the shorter of said legs having its upper portion facing forwardly and its lower portion rearwardly; each of said legs having a foot rigidly, perpendicularly secured thereto its bottom end, the rearward foot, attached to said shorter leg, being of greater length than the forward foot; the upper end of said longer leg being bent forwardly at a point located approximately ¼ to ⅓ of the distance from the pivot point to the top of said leg at an angle between about 20° and 45°; a tie member



pivotally attached to one of said legs at a point spaced below the pivot pin and adjustably attachable to the other leg at a similarly spaced point below the pivot pin; the upper end of each of said legs having an arm rigidly perpendicularly affixed to the upper end of said leg, the forwardmost arm being lower than the rearwardmost arm and being adapted to support the bottom of a loudspeaker, and said upper arm being adapted to support the rear of said speaker in a backwardly tilted orientation.

5,024,408

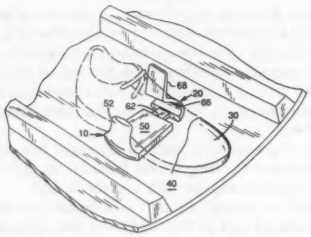
ATHLETIC SHOE HOLDER

Maynard Magee, 63195 O. B. Riley Rd., Bend, Oreg. 97701

Filed Apr. 30, 1990, Ser. No. 516,817

Int. Cl.[5] A47G *29/00*

U.S. Cl. 248—206.5 **5 Claims**



1. A holder for removably securing a shoe to a ferromagnetic surface comprising:

a first member molded of thermoplastic having an elongated base portion with a top and bottom surface, the top surface being generally flat, said base portion having a first end and a second end, the second end having an end surface generally perpendicular to the length of the base portion, said base portion having an elongated cavity therein extending inwardly from an aperture on said base second end, said cavity having a planar lower surface and an upper surface provided with a plurality of saw tooth elements the lower edges of which lie on a plane parallel to and spaced a predetermined distance from said lower surface, each element having a length generally equal to the width of the cavity, said aperture being defined in part by a lower lip extending upwardly with respect to the lower surface of said cavity and an upper lip the edge of which lies in said plane, said base portion having a plurality of magnets recessed into the bottom surface thereof, said first member also having an integral vertical curvilinear side portion projecting generally upwardly and over said base portion from the first end of the base toward the second end of the base;

a second member molded of thermoplastic comprising an elongated tongue comprising a shank portion of predetermined thickness, the shank having a distal end, a base end, and upper and lower parallel surfaces spaced apart a distance substantially equal to the spacing between said upper and lower lips, said tongue being slidably received in the cavity of the first member, the tongue having a latching tab projecting upwardly from said upper surface of said shank at the distal end thereof, the combined height of said tab and said shank being less than said predetermined distance, the tab being adapted to engage any of said saw tooth elements of the first member whereby to secure said tongue from sliding movement toward said aperture, the second member having an integral vertical curvilinear projection extending upwardly from said tongue base end, said projection being curved inwardly over the tongue and toward the distal end of the tongue, the projection having an upper end with a release handle integrally attached thereto and extending generally vertically therefrom;

whereby a shoe may be locked in said apparatus by placing a shoe with its mid-section between the side portion of the first member and the projection of the second member and manually pressing the tongue of the second member into the cavity of the first member so that said side portion and said projection engage the sides of the shoe, biasing the shoe downwardly against the flat surface of the base and biasing the distal end of said elongated tongue upwardly to engage the latching tabs with a saw tooth element within the elongated cavity to lock the first member in position relative to the second member, said first member being releasable by pressing the release handle toward the first member so that said tongue pivots on said lower lip to disengage said tab from said saw tooth elements to permit said second ember to be moved with respect to said first member to release a shoe held by said members.

5,024,409

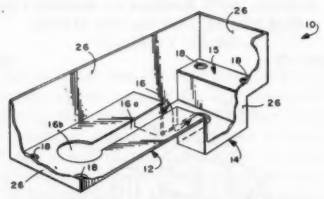
SLIDABLY LOCKABLE BRACKET

David J. Bohnen, 1910 Ala Moana Blvd., #18-D, Honolulu, Hi. 96815

Filed Apr. 4, 1990, Ser. No. 504,547

Int. Cl.[5] F16B *12/00*

U.S. Cl. 248—222.4 **5 Claims**



1. A slidably lockable bracket for a sliding member having a substantially cylindrical post having a post diameter and a head having a head height and a head diameter, attached to one end of said post, said head diameter being greater than said post diameter, comprising:

a base having a keyhole aperture, which keyhole aperture has:

a circular portion having a diameter greater than said head diameter; and

an elongated slot having a width intermediate between

said post diameter and said head diameter extending away from said circular portion;

attachment means for attaching said base substantially parallel to a surface wherein said circular portion is spaced apart from said surface by a first distance greater than said head height; and

said base having a recess at a recessed end of said slot opposite said circular portion, said recessed end of said slot being recessed away from said surface by a second distance greater than said first distance and said recess being adapted to receive said head, wherein:

said base has a plurality of edges and said attachment means comprises a plurality of side members, each attached to one of said edges.

5,024,410

REAL ESTATE SIGN FASTENER

Donald W. Ripley, 10234 E. Emily Pl., Tucson, Ariz. 85730

Filed Feb. 2, 1990, Ser. No. 473,811

Int. Cl.[5] A47H *1/16*

U.S. Cl. 248—302 **1 Claim**

1. A real estate sign display apparatus comprising:

first real estate sign having top and bottom edges and having circular holes located near the top and bottom edges of said sign;

support means having horizontal support member, said horizontal member capable of holding said first real estate sign from said holes located near the top edge of said sign;

second real estate sign having top and bottom edges and having circular holes located near the top and bottom edges of said sign;

attaching means comprising wire member bent near the middle of said member and having blunt ends, so as to form two. substantially parallel, wire portions, first parallel wire portion having J shaped portion near the end of said wire and said J shape defining a plane that is perpendicular to said parallel wire portions, second parallel wire portion having end bent away from said first parallel wire portion, so that said attaching means may join said signs together through said circular holes located near said bottom and said top edges via inserting said wire member through said circular holes located near said top edge of said second sign and through said circular holes located near said bottom edge of said first sign and joining said bent away portion within said J shaped portion.

5,024,411

BEVERAGE CONTAINER HOLDER

John R. Elwell, Dearborn, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Aug. 20, 1990, Ser. No. 570,254

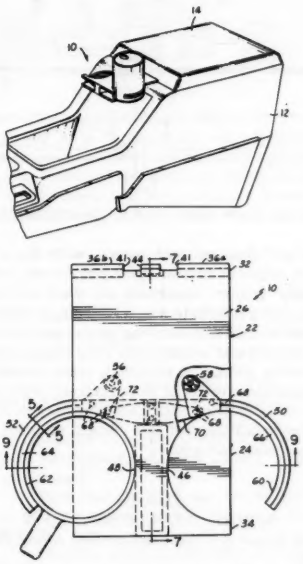
Int. Cl.[5] A47K *1/08*

U.S. Cl. 248—311.2 **12 Claims**

1. A beverage container holder adopted for use in:

a center console of a vehicle, said center console including: walls defining a storage compartment, said walls defining said storage compartment including a front wall, said front wall including a transversely extending lip portion extending into said storage compartment; and a hinged cover for covering of the top of said storage compartment; said beverage container holder assembly comprising:

a lower beverage container support portion and an upper elongate member vertically spaced from one another and connected at the center with an upstanding web member, said upper elongate member including a first connection end and a second container holding end, said first connection end including a means for removably engaging the transversely extending lip thereby supporting said beverage container holder in a useable position;



said second container holding end including a pair of outboard facing arcuate surfaces for forming concavities in said second container holding end for supporting a portion of the sides of a pair of beverage container;

a pair of pivotal arms pivotally connected to said upper elongate member; said pair of arms each including an arcuate end portion for engaging a side of a beverage container opposite said pair of opposed arcuate surfaces; and

a means operable between said web portion and said pivotal arms for holding the arms at various spaced locations from said arcuate surfaces of said upper elongate member.

5,024,412

HANGER ASSEMBLY

Shih-Ho Hung, Taichung Hsien, and Tsui-Chen Hsu, Taichung, both of Taiwan, assignors to Llama Precision Inc., Taichung Hsien, Taiwan

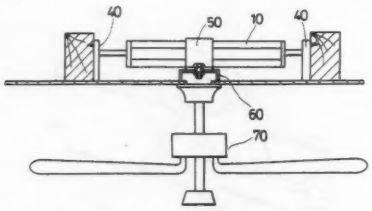
Filed Oct. 15, 1990, Ser. No. 597,309

Int. Cl.[5] B42F *13/00*

U.S. Cl. 248—343 **3 Claims**

1. An expansible load-bearing junction box hanger assembly adapted for installation from beneath the ceiling and through a junction box opening in the ceiling, including a first wall and a second wall spaced from said first wall, said first and said second walls having a plurality of spike protrusions to engage two spaced adjoining ceiling joists; an elongated linearly ex-

panding brace means which is aligned with and connected between said first and said second walls, said brace means readily expanding in length to force said first and said second walls to contact and engage their respective ceiling joists, said brace means including a tubular member rotatably mounted to said first wall, a threaded rod member threadedly and telescopically connected to said tubular member, one end of said threaded rod member being in fixed non-rotative engagement with said second wall, said first and said second walls supporting said brace means in a direction substantially parallel to the plane of the ceiling; and a junction box connecting means to rigidly connect a junction box of a heavy load to the central



section of said brace means; and improvements, which comprise:

each of said first and said second walls has a receiving groove adjacent to said spike protrusions; said hanger assembly further comprising an alarm device, a cell means, and a switching means including a contact switch disposed in each said receiving groove and actuated when said first and said second walls fully engage their respective ceiling joists, said switching means electrically connecting said alarm device to said cell means to operate said alarm device when said switching means is actuated, thereby indicating that said hanger assembly has fully engaged said ceiling joists.

5,024,413

SPRUNG BICYCLE SEAT POST

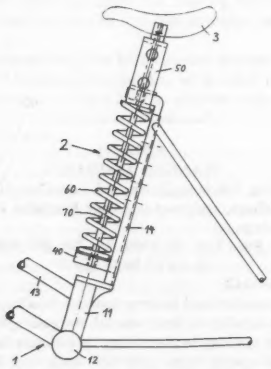
Karel Papp, Saumweg 2, Gebenhofen, 8901 Affing, Fed. Rep. of Germany

Filed Feb. 27, 1990, Ser. No. 485,502

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1989, 8902327[U]

Int. Cl.[5] A63K *3/00*

U.S. Cl. 248—623 **12 Claims**



1. A sprung bicycle seat post comprising:

seat mounting means for carrying a seat;

means for supporting the seat mounting means for guided movement in a lengthwise-displaceable fashion;

means cooperative between the seat mounting means and the supporting means for preventing relative rotation of one with respect to the other:

wherein the supporting means is in the shape of a U-shaped bracket with a main part extending lengthwise, and an upper and a lower flange located at respective upper and lower ends of the main part and extending at an angle thereto;

wherein the seat mounting means has a box-shaped guide body with two parallel side walls forming a guide channel therebetween, said side walls extending in the direction of lengthwise-displacement of the seat mounting means, the upper flange of the supporting means being positioned between the side walls of the guide body and having surfaces engaging the guide channel, the guide body including an upper end section and a lower end section, respectively joining upper and lower ends of the side walls:

a compression spring disposed between the lower flange of the supporting means and the lower end section of the seat mounting means; and

a guide rod, extending lengthwise along the displacement axis of the seat mounting means through axially aligned openings in the upper and the lower flange of the supporting means, the guide rod further extending between the upper and lower end sections of the guide body.

5,024,414

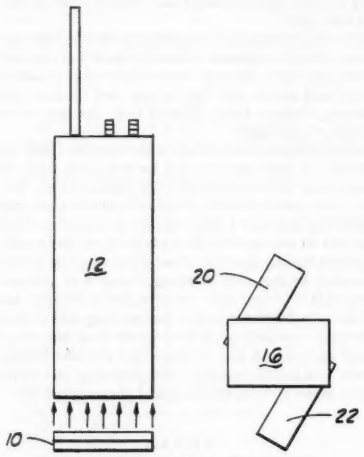
STABILIZING DEVICE FOR HAND-HELD/PORTABLE ELECTRONIC DEVICE

Dennis R. Drain, P.O. Box 95741, Oklahoma City, Okla. 73143

Filed Feb. 26, 1990, Ser. No. 484,812

Int. Cl.[5] F16M *13/00*

U.S. Cl. 248—688 **2 Claims**



1. A stabilizer device for attachment to the bottom of an electronic unit to provide upright stability, comprising:

an upper layer member having opposite ends, top and bottom;

means secured on the top of the upper layer for affixure to the unit bottom; and

a bottom layer consisting of two leg members each pivotally affixed at respective opposite ends of said upper layer member and each being pivotable outward in a plane

parallel to the upper layer to form approximately a 45° angle with said upper layer member to increase the support stabilization of said unit.

5,024,415

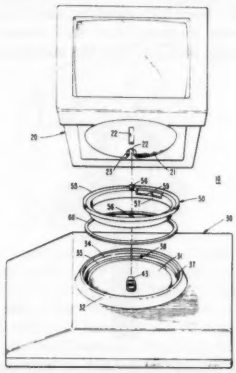
TILT AND SWIVEL APPARATUS FOR A DISPLAY MONITOR

Alfred Purens, Chicago, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 30, 1989, Ser. No. 429,239

Int. Cl.[5] F16M *13/00*

U.S. Cl. 248—923 **11 Claims**



1. Apparatus for mounting a display monitor and for permitting and limiting the extent of tilting and swiveling of the monitor, said apparatus comprising:

a projection extending downwardly from the bottom surface of the monitor forming a convex spherically contoured surface with said spherically contoured surface having a pair of elongated slots located in predetermined locations at opposite sides thereof;

a support structure for the monitor having a cavity for accommodating said spherically contoured surface with said cavity surrounded by a collar having an annular groove therein;

a swivel ring located in said annular groove and arranged for rotation therein with said swivel ring having a beveled top surface for mating with said spherically contoured surface;

a pair of projections extending from a top surface of said swivel ring with each projection engaging its respective slot in the spherically contoured surface and wherein said projections slide within the slots permitting tilting of the monitor by allowing relative motion between the spherically contoured surface of the monitor and the beveled surface of said swivel ring and wherein said projections force said swivel ring to rotate with said spherically contoured surface during swiveling of the monitor and not allowing relative respectively swiveling motion between said spherically contoured and beveled surfaces.

5,024,416

VALVE ACTUATOR

Mordechai Cohen, San Diego, Calif.,, assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jun. 22, 1989, Ser. No. 370,251

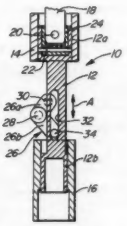
Int. Cl.[5] F16K *31/44*

U.S. Cl. 251—78 **12 Claims**

1. An actuator system for a rotary valve operated by a rotatable shaft to select a desired flow rate through the valve, comprising:

an actuator member movable in a linear path transverse to the axis of said shaft through a stroke range for changing angular settings of the shaft about its axis; and

linkage means operatively connected between the actuator member and the shaft for transmitting linear movement of the actuator member to angular movement of the shaft, including lost motion means in the form of a pin-and-slot



connection such that the actuator member moves through a portion of its stroke range without effecting angular movement of the shaft before effecting a change in the angular setting of the shaft, said linkage means including first and second link arms pivotally connected to each other at adjacent ends.

5,024,417

CONTROL CIRCUITRY FOR A SOLENOID OPERATED CONTROL VALVE

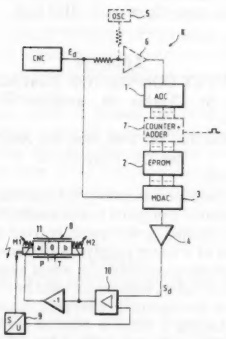
Walter Voxbrunner, Lohr/Main, Fed. Rep. of Germany, assignor to Mannesmann Rexroth GmbH, Lohr/Main, Fed. Rep. of Germany

Filed Mar. 29, 1990, Ser. No. 501,271

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1989, 3911259

Int. Cl.[5] F16K *31/06;* **G05D** *13/044*

U.S. Cl. 251—129.04 **4 Claims**



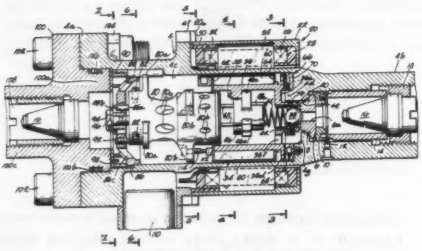
1. A control circuitry for a solenoid operated control valve comprising means for correcting the valve characteristic, said correcting means including an analog/digital converter, a table store and a digital/analog converter, to correct the electrical input signal for controlling the control valve by values stored in said table store, characterized by storing gain values in said store and correcting the input value by stepwise varying said input signal by said gain values called from said store.

5,024,418

FLUID FLOW RATE CONTROL DEVICE

Robert H. Reinicke, Mission Viejo; Rafic Mohtar, Redondo Beach, and Richard O. Nelson, Torrance, all of Calif., assignors to Eaton Corporation, Cleveland, Ohio

Filed Sep. 7, 1989, Ser. No. 404,296
Int. Cl.[5] F16K *31/04*
U.S. Cl. 251—129.11 17 Claims



1. A fluid flow rate control device comprising:

a housing having an inlet passage, an interior chamber communicating with said inlet passage, an outlet passage leading from said interior chamber, and a valve seat disposed in said outlet passage;

a brushless DC motor in said housing having a rotor supported in said interior chamber, bearing means providing for free rotary movement of said rotor about a rotational axis and for free axial sliding movement of said rotor along said rotational axis independent of said rotary movement thereof, openings in said rotor permitting fluid passage therethrough, said rotor carrying a poppet engaging said valve seat to close off said outlet passage from said interior chamber in an extreme axial position of said rotor; and

means effecting axial translation of said rotor in response to rotation thereof for moving said poppet away from said valve seat comprising a plurality of flexible bands having first ends attached to said rotor at angularly spaced intervals and second ends fixedly secured relative to said housing at points axially spaced from said rotor and correspondingly angularly spaced with said first ends, said bands being disposed parallel to said rotational axis in said extreme axial position of said rotor, rotation of said rotor twisting said bands from said parallel disposition to effect foreshortening thereof in an axial direction and translation of said rotor away from said valve seat.

5,024,419

FAUCET CONNECTOR ASSEMBLY

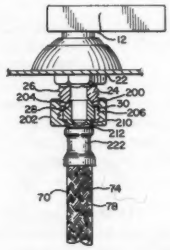
Philip Mulvey, St. Charles, Ill., assignor to Euroflex, S.A., Seine, France

Filed Jul. 24, 1989, Ser. No. 383,708
Int. Cl.[5] F16K *51/00*
U.S. Cl. 251—148 10 Claims

1. A faucet connector assembly, comprising:

a flexible bendable elongated braided metallic hose assembly for flexibly extending downwardly from a base of a faucet to an outlet of a water supply distribution source selected from the group consisting of a water supply pipe, tubing, and a shutoff valve, said faucet inlet having an inner wall providing a downwardly diverging faucet seat, said hose assembly having a flexible braided metallic outer shell annularly surrounding a resilient flexible inner tube comprising a substantially water-impermeable elastomeric core, and said hose assembly having an upper faucet-facing end for positioning adjacent said faucet inlet and a lower water supply-facing end for positioning adjacent said outlet of said water supply distribution source; and

universal faucet fitting means comprising a faucet fitting assembly connected to said upper faucet-facing end of said braided metallic hose assembly for sealingly engaging and connection to said faucet inlet, said faucet fitting assembly having a rotatable internally threaded metal coupling nut for threadedly engaging said externally threaded faucet inlet and having a unitary universal stationary faucet fitting about which said coupling nut rotates, said unitary faucet fitting having a universal arcuate tubular faucet fitting head defining a substantially rigid cone-style connector with a convex outer face for seating and wedging against said inner wall of said inlet in press fitting engagement with said downwardly diverging faucet seat, a tubular shoulder extending integrally downwardly from said faucet fitting-head providing a bearing support surface for supporting said rotatable coupling nut, said shoulder having an upper portion and a lower portion, an elongated sleeve providing a main body portion extending integrally downwardly from said shoulder, said shoulder having a larger outside diameter than said sleeve but having a smaller outside diameter than the maximum outside diam-



eter of said faucet-fitting head, at least one downwardly converging frustoconical tubular foot extending integrally downwardly from said sleeve for snugly fitting into said upper faucet-facing end of said braided metallic hose assembly, said foot, sleeve, shoulder and head of said unitary faucet fitting being integral and in coaxial alignment with each other along an axis, said faucet fitting defining an elongated inlet passageway extending along said axis through said foot, sleeve and lower portion of said shoulder and defining a larger outlet passageway extending along said axis through said arcuate faucet fitting head and upper portion of said shoulder, said outlet passageway communicating with said inlet passageway and said faucet inlet, said outlet passageway having a larger diameter than said inlet passageway, said faucet fitting defining an intermediate frustoconical passageway connecting said inlet passageway and said outlet passageway, and said faucet fitting assembly having a tubular crimping member.

5,024,420

FOLDABLE HANDRAIL ASSEMBLY

Gerald W. Downing, 4621 S. Galapago, Englewood, Colo. 80110

Filed Oct. 26, 1989, Ser. No. 435,733
Int. Cl.[5] E04H *17/14*
U.S. Cl. 256—67 17 Claims

1. A foldable handrail assembly for use on either side of a doorway in a wall of an enclosure, said assembly comprising:

a handrail having an inner end portion and an outer end portion;

said inner end portion being pivotally mounted adjacent a doorway in a wall of an enclosure at a pivotal connection with said wall to pivot about a first pivot so that said handrail will swing between an outwardly projecting extended position and a downwardly extended folded position;

a length adjustable first support brace having a lower end portion and an upper end portion arranged for holding said handrail against vertical movement in said outwardly

extended position, said first support brace being movable to a folded position;

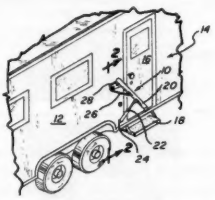
said lower end portion being pivotally mounted to said wall adjacent said doorway and in substantially vertical alignment with said first pivot to pivot about a second pivot;

said upper end portion being pivotally mounted at a pivotal connection with said handrail, and in substantially vertical alignment with said first pivot along said handrail to pivot about a third pivot;

said first support brace having locking means for locking said first support brace against lengthwise movement in said extended position;

a second support brace having an inner end and an outer end for holding said handrail and first support brace against lateral movement in said extended position;

said second support brace having said inner end pivotally



mounted at a pivotal connection with said wall at a fourth pivot located at an upper position laterally out to one side of said inner end portion of said handrail and first support brace and said outer end pivotally mounted to a pivotal connection with said handrail at a fifth pivot;

the mounting for said handrail, first support brace and second support brace to said wall being provided by mounting bracket means mounted on said wall to secure said handrail, first support brace and second support brace to said wall;

said mounting bracket means including a first mounting bracket for pivotally mounting said inner end portion of said handrail and said inner end portion of said second support brace to said wall; and

said mounting bracket means including a second mounting bracket for pivotally mounting said lower end of said first support brace to said wall.

5,024,421

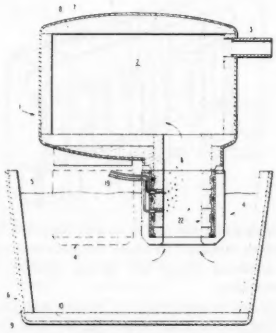
INTERLOCKING SNORKEL REFRACTORY

William G. Cooley, Valparaiso, Ind., assignor to USX Corporation, Pittsburgh, Pa.

Filed May 8, 1990, Ser. No. 520,478

Int. Cl.[5] C21C *7/10*

U.S. Cl. 266—210 **12 Claims**



1. A degasser snorkel for circulating molten metal from a ladle to a vacuum vessel to attendantly degas the molten metal, said degasser snorkel comprising:

(a) a snorkel can having an inner and an outer surface and being secured to an underside of said vacuum vessel;

(b) a castable layer surrounding said outer surface of said snorkel can;

(c) a pressure grout layer disposed on said inner surface of said snorkel can; and

(d) an inner refractory lining defining a bore through which said molten metal circulates and including a plurality of interlocking refractory bricks fitted together around said inner surface of said snorkel can and being secured thereto by said pressure grout layer, a plurality of rows of said interlocking refractory bricks being built-up to form said inner refractory lining, wherein each of said interlocking refractory bricks includes interlocking means on opposite vertical side faces for interlocking with adjacent interlocking refractory bricks.

5,024,422

ONE-PIECE STOPPER ROD

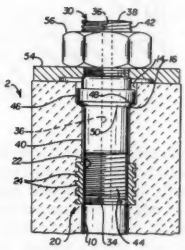
Mark K. Fishler, Tervuren; Jean-Marie Koten, Ostende, both of Belgium, and Pascal Dubois, Feignies, France, assignors to Vesuvius Crucible Company, Pittsburgh, Pa.

Continuation of Ser. No. 291,497, Dec. 29, 1988, Pat. No. 4,946,083. This application Jul. 6, 1990, Ser. No. 549,444

The portion of the term of this patent subsequent to Aug. 7, 2007, has been disclaimed.

Int. Cl.[5] B22D *11/10*

U.S. Cl. 266—272 **12 Claims**



1. A stopper rod adapted for attachment to a lifting mechanism adjacent to a metallurgical vessel, comprising:

an elongated stopper rod body of a pressed and fired refractory material having an upper end and a lower end, and having an axial bore extending from the upper end toward said lower end; and

a metal bushing insert co-pressed and fired within the stopper rod body in a spaced relationship adjacent said upper end, said insert having a threaded bore positioned co-axially with the bore of the stopper rod body and adapted to threadably receive a threaded metal rod for attachment to said lifting mechanism.

5,024,423

SEMICONDUCTOR DIFFUSION FURNACE INNER TUBE

Fukuji Matsumoto, Takefu; Yoshio Tawara, Fukui; Michio Hayashi, Takefu, and Osamu Yamada, Fukui, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Aug. 15, 1989, Ser. No. 393,779

Claims priority, application Japan, Aug. 15, 1988, 63-202828

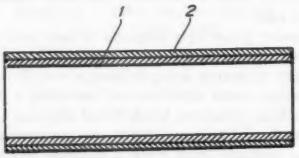
Int. Cl.[5] C21B *7/02*

U.S. Cl. 266—283 **8 Claims**

1. An inner tube for use in a semiconductor diffusion furnace, comprising

a linear or diffusion tube formed of a silicon carbide, and

an insulating layer consisting essentially of a material selected from the group consisting of alumina, silica, zirconia, zircon and mixtures thereof,



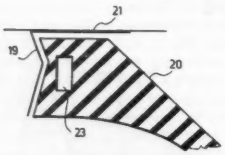
said insulating layer being formed by spray depositing said material on the entire outer surface of said liner or diffusion tube at a thickness of about 0.1 mm to about 0.5 mm.

5,024,424

AIR-SPRING, IN PARTICULAR FOR THE USE UNDER EXTREME CONDITIONS

István Fejérdy; Ottó Farkas, and Gábor Havasi, all of Budapest, Hungary, assignors to TAURUS Gumiipari Vállalat, Budapest, Hungary

Filed Aug. 22, 1988, Ser. No. 234,885
Claims priority, application Hungary, Sep. 2, 1987, 3930/87
Int. Cl.[5] F16F *9/04*
U.S. Cl. 267—64.27 **7 Claims**



1. An air spring comprising an impact surface, a substantially rigid flanged disk attached at its exterior surface in a plane to and disposed partially parallel to said impact surface, said flange disk having an edge which ranges from a first point on said exterior surface at which the flanged disk is no longer disposed parallel to said impact surface, in a direction outwardly from said first point to a second point on said exterior surface, said second point being on a line that is perpendicular relative to said plane, said flanged disk having a re-entrant portion from said second point inwardly to a third point that is spaced from said impact surface and that represents the edge of said flanged disk, and a deformable diaphragm adapted to be maintained at an edge thereof in a substantially fluid-tight, mating relationship to said flanged disk before said second point.

5,024,425

ELASTOMERIC SLEEVE SPRING

Hans-Werner Schwerdt, Laudenbach, Fed. Rep. of Germany, assignor to Firma Carl Freudenberg, Weinheim/Bergstr., Fed. Rep. of Germany

Filed Jan. 26, 1990, Ser. No. 471,181
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1989, 3905686
Int. Cl.[5] F16F *13/00*
U.S. Cl. 267—140.1 **1 Claim**

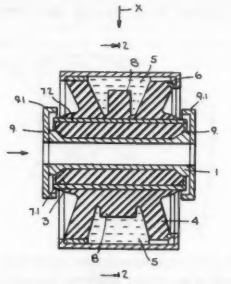
1. Elastomeric sleeve spring with an hydraulic damping, comprising:

two circumferential connecting pieces having parallel axes and one enclosing the other in a relationship parallel to their axes and the connecting pieces being radially spaced apart forming a gap therebetween;

in the gap two external and internal spring bodies successively disposed in a radial direction and made of an elastomeric material of which the external spring body encloses a plurality of liquid-filled chambers with a basically cross-like configured profile;

the external spring body having a damping opening connecting at least two chambers of the external spring body which are opposite to one another;

an intermediate mass being provided between the external and the internal spring bodies, the intermediate mass including two opposing half shells which are associated with a profile of the external spring body in a mirror-inverted relationship, the half shells and the external spring body being permanently attached to each other;



the half shells enclosing a free space and the internal spring body being pressed into the free space while radially pressing together the external spring body;

the sleeve spring including a guiding element and at least at one end the half shells being associated with the guiding element, the guiding element being attached to a connecting piece which supports the internal spring body at its inside; and

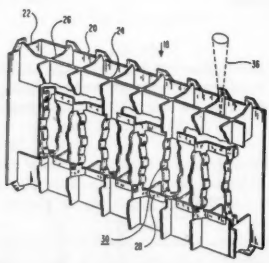
the guiding element being flange-like configured and having an annular projection, the annular projection externally enclosing the half shells.

5,024,426

BIMETALLIC SPRING MEMBER FOR RADIATION ENVIRONMENT

Raymond A. Busch, Benton, and John F. Patterson, Richland, both of Wash., assignors to Advanced Nuclear Fuels Corporation, Richland, Wash.

Filed Mar. 17, 1989, Ser. No. 324,947
Int. Cl.[5] F16F *1/18*
U.S. Cl. 267—158 **16 Claims**



1. A spring member for use in an environment having radiation of sufficient intensity to cause significant stress relaxation during the working life of the spring member, said spring member comprising:

at least first and second sheets of spring material fastened to each other as a layered structure, the first sheet having a first irradiation growth rate and the second sheet having a

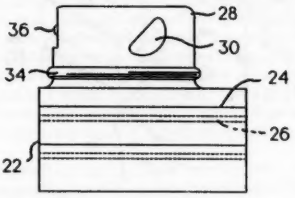
second irradiation growth rate, the second rate being significantly greater than the first rate.

5,024,427

QUICK-CHANGE HEAD FOR PRECISION MACHINE VISE

George R. Swann, 336 Old Babcock Trail, Gibsonia, Pa. 15044

Filed Feb. 6, 1989, Ser. No. 306,511
Int. Cl.[5] B25B *1/10*
U.S. Cl. 269—136 **15 Claims**



1. In a machine vise having a base, a first jaw secured to said base and a second jaw supported on said base for movement toward and away from said first jaw, the improvement which comprises:

a. said second jaw comprises:

1. a first element having an extended member having a first bore extending tranversely through said extended member, said first bore having a flat surface therethrough, said flat surface between disposed at an angle such that said flat surface faces in a direction that is toward said base and toward said first jaw; and

2. a second element having a recessed area adapted to receive said extended member, said second element having a second bore aligned with said first bore; and

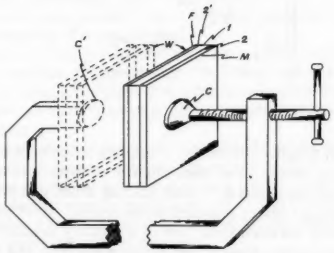
b. a removable locking pin adapted for axial insertion into both of said second bore and said first bore, said removable locking pin having a planar portion that substantially corresponds to said flat surface of said first bore for engagement therewith to thereby couple said second element to said first element and said locking pin being further adapted for axial removal from said first and said second bores to uncouple said second element from said first element.

5,024,428

MAGNETIC WORKPIECE CLAMPING BLOCKS

Ronald Ramsay, Plymouth, N.H., assignor to Academy of Applied Science, Concord, N.H., a part interest

Filed Jul. 5, 1990, Ser. No. 548,135
Int. Cl.[5] B25B *1/24*
U.S. Cl. 269—274 **6 Claims**



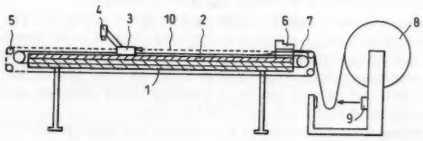
1. A relatively resiliently compressible block for ready attachment to and removal from a workpiece clamping surface of relatively hard ferrous metal, said block having opposing flat surfaces of area larger than that of the clamping surface; one surface being provided substantially throughout its area with a resilient magnetized plastic surface for contacting the ferrous metal clamping surface at variable desired subareas of said block surface and magnetically attaching thereto, said subareas being selected to accommodate for different shapes and orientations of the workpiece-to-be-clamped; and the opposite surface of the block providing for engaging the workpiece and cushioning the same from the hard metal clamping surface when operated to clamp the same; the force of magnetic attachment of the uncompressed resilient magnetized plastic surface to the clamping surface being sufficient to permit readily movable relative sliding adjustment of the position of the block over the clamping surface to select desired block subareas of attachment as in setting up the workpiece, and without magnetic detachment of block and clamping surface during such adjustment, but less than the increased magnetic attachment force resulting upon clamping compression of the resilient magnetized plastic which supplements the mechanical clamping force to secure the attachment of the block and clamping surface against relative movement in clamped condition.

5,024,429

METHOD AND APPARATUS FOR PILING PLURAL SHEETS OF MATERIAL HAVING A REPETITIVE PATTERN THEREON, WHILE ENSURING THE VERTICAL ALIGNMENT OF THE PATTERNS FROM ONE SHEET TO THE NEXT

Jean Etcheparre, and Bernard Etchparre, both of Bordeaux, France, assignors to Lectra Systemes S.A., Cestas-Bourg, France

Filed Mar. 12, 1990, Ser. No. 493,008
Claims priority, application France, Mar. 16, 1989, 89 03493
Int. Cl.[5] B65H *29/46*
U.S. Cl. 270—30 **12 Claims**



1. A method for piling, prior to a cutting-out process, a plurality of sheets of material having repetitive patterns theron while ensuring vertical alignment of said patterns from one sheet ply to the next, said method comprising the successive steps of:

laying down a relatively rigid sheet over a cutting table;

drawing out a first sheet of material having repetitive patterns thereon from a feeding device and laying down said sheet over said relatively rigid sheet;

recording an optimized disposition of all the pieces to be cut out;

introducing vertical perforating elements at predetermined locations of said first sheet to locate the patterns;

drawing out, laying down and fixing sheets of material one by one while maintaining the superposition of the patterns by inserting said sheets through said perforating elements, the latter already being in position; wherein:

said drawing out and laying down of each sheet is performed automatically;

a free end of a sheet is engaged in a gripping device mounted transversally on a main, longitudinally displaceable carriage to which is attached, at a rear portion thereof, a light transporting band;

said carriage is displaced to a front end of said cutting table, whereby a certain length of material is stretched out over said table, while said material is made to rest on said light

transporting band to protect said material from said perforating elements;

said gripped free end is released while being maintained over said table;

said carriage and its light transporting band are returned to a rear portion end of said table; and

said material sheet is cut transversally to separate said sheet from said feeder.

5,024,430

PAPER HANDLING APPARATUS

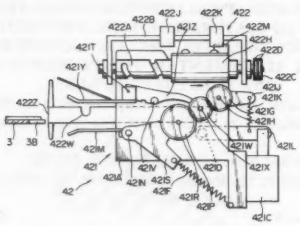
Nobuyoshi Seki; Nobuyuki Morii; Yoshihide Sugiyama; Takashi Komada; Masatoshi Hosoi; Atuhisa Hujiwara; Tsutomu Ichinose, all of Nagoya; Goro Mori, Tokyo; Toshiyuki Kikuchi, Tokyo, and Masahiro Minato, Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jan. 4, 1990, Ser. No. 461,001

Claims priority, application Japan, Jan. 18, 1989, 1-7601; Jan. 18, 1989, 1-7602; Jan. 18, 1989, 1-7603; Jan. 18, 1989, 1-7604; Jan. 18, 1989, 1-7605; Jan. 18, 1989, 1-7606; Jan. 18, 1989, 1-7607; Dec. 4, 1989, 1-313506

Int. Cl.[5] B42B *2/00*

U.S. Cl. 270—53 **9 Claims**



1. A paper handling apparatus comprising:

a plurality of bins arranged one above another;

paper moving means movable up and down along said plurality of bins for gripping an end of a stack of paper sheets having been received from external equipment, sorted and stacked on any one of said plurality of bins, pulling said stack out of said bin by a predetermined distance, and returning said stack into said bin; and

stapling means for stapling a portion of said stack pulled out by said paper moving means which is adjacent to said end;

said paper moving means comprising:

gripping and pulling means comprising a pair of gripping members located one above the other for gripping the end of the stack loaded on said bin; and

pushing means for pushing the end of the stack having been stapled to return said stack to an original position on said bin;

said gripping and pulling means and said pushing means being provided independently of each other.

5,024,431

SHEET TRANSPORT DEVICE WITH EASY SHEET JAM HANDLING

Tadafumi Shimizu, and Tadashi Ohira, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 13, 1988, Ser. No. 257,517

Claims priority, application Japan, Oct. 16, 1987, 62-262315; Oct. 16, 1987, 62-262316; Oct. 16, 1987, 62-262317

Int. Cl.[5] B65H *7/12*

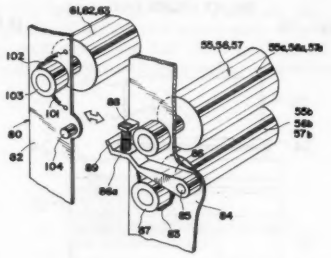
U.S. Cl. 271—263 **4 Claims**

1. A sheet transport apparatus comprising:

a first sheet transport mechanism including a first path and a first roller for transporting a sheet along the first path;

a second sheet transport mechanism including a first frame member having a second roller and a second frame member having a third roller, said second frame member being movable from a first position where said second and third rollers are pressing against each other to a second position where said second and third rollers are separate from each other, said first and second frame members constituting a second path connected to said first path when said second frame member is at the first position;

a drive source for rotating said first roller in a first direction



to feed the sheet toward said second path and in a second direction reverse to said first direction;

a detector for detecting the second frame moving from the first position to the second position and for generating an opening signal; and

a controller for controlling said drive source so that said first roller is driven in the first direction in a normal state and in the second direction in response to said opening signal.

5,024,432

SHEET TRANSFER DEVICE FOR A PRINTING MACHINE

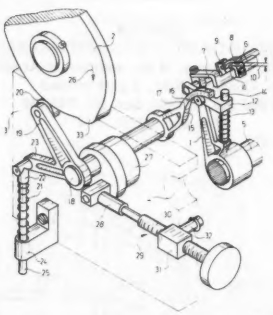
Norbert Thünker, Hirschberg; Gerhard Pollich, Heidelberg, and Heiner Luxem, Wilhelmsfeld, all of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Oct. 4, 1989, Ser. No. 417,706

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1988, 3833645

Int. Cl.[5] B65H *5/12*

U.S. Cl. 271—268 **4 Claims**



1. Sheet transfer device for a printing machine for taking over sheets which have been aligned at front lays and for transferring the sheets to a sheet-guiding drum, comprising

a pregripper device disposed across a sheet travel path at a location between front lays of a printing machine and a sheet-guiding drum of the printing machine and swivellable between a sheet takeover position wherein a sheet aligned at the front lays is taken over by said pregripper device and a sheet transfer position wherein the sheet is

released by said pregripper device to a sheet-guiding drum;

gripper pads carried by said pregripper device across the sheet travel path;

a gripper shaft swivel-mounted in said pregripper device and carrying gripper fingers in juxtaposed relationship with said gripper pads;

means for connecting said gripper shaft and said gripper fingers so that swivelling movements of said gripper shaft are transmitted to said gripper fingers;

a swivel device for swivelling said gripper shaft about a longitudinal axis thereof,

a cam segment having a control surface for controlling said swivel device, said control surface being formed by linear generatrices, said cam segment being adjustable so that a gap, formed between said gripper fingers and said gripper pads in the takeover position of the pregripper device and existing until alignment of the sheet at the front lays is terminated, is settable in accordance with the thickness of the sheets, said gap being so defined that said gripper fingers form top lays for a respective leading sheet edge; and

a control shaft for carrying said cam segment, said control shaft extending parallel to said generatrices of said control surface and being arranged so as to be adjustable parallel to itself.

5,024,433

MANUALLY ADJUSTABLE ROPES SUSPENDED THEREFROM

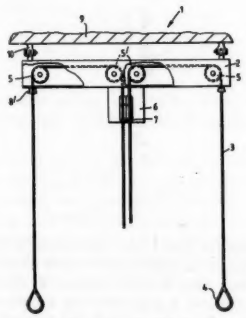
Kaare Mosberg, Turveien 20, Groosasen, N-4890 Grimstad, Norway

Continuation of Ser. No. 297,257, Jan. 5, 1989, abandoned. This application Mar. 20, 1990, Ser. No. 497,765

Claims priority, application Norway, May 14, 1987, 872013

Int. Cl.[5] A63B *21/12;* **A61H** *1/02*

U.S. Cl. 272—120 **4 Claims**



1. A physical exercise apparatus with a bar having a pair of manually adjustable ropes, comprising

a bar having internally mounted guide means for turning the direction of a pair ropes;

means for suspending said bar from a ceiling structure, said suspension means having articulating means to enable a swinging movement of said bar in a direction transversely thereof by movement of a first section of each of a pair of ropes;

said pair of ropes mounted on said guide means, each of said ropes having said first section depending from a respective end portion of said bar and each having supporting loop means for user gripping at an end of said first section, and each of said ropes having a second section depending from a central portion of said bar;

means depending from said central portion of said bar for releasably clamping a portion of said second section of each of said ropes to individually adjust a vertical position of each of said supporting loop means, said means including a mechanical member depending from said bar, said member supporting two quick-releasable cleatlock type means for engaging said ropes.

5,024,434

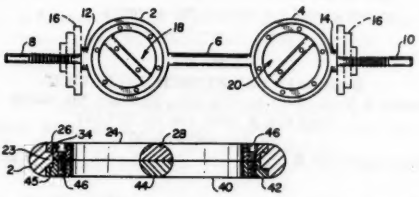
MULTIFLEX EXERCISE DEVICE

Mark R. Smith, 502 Stanely Ave., Clarksburg, W. Va. 26301

Filed Mar. 27, 1990, Ser. No. 499,797

Int. Cl.[5] A63B *21/072*

U.S. Cl. 272—123 **21 Claims**



1. The weight lifting apparatus comprising: an elongated bar having a pair of spaced, open circular housings mounted thereto, each of said circular housings having a support member extending inwardly along at least a portion of an inner circumference of said housing, and a handle assembly positioned within each of said circular housings and rotatably mounted on the support member, with each handle assembly including a pair of rotating handle members positioned on opposite sides of said support member and removeably fastened together in sliding engagement with said support member.

5,024,435

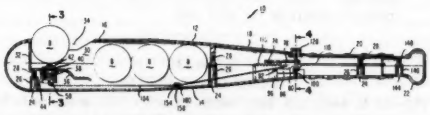
TOY BAT ASSEMBLY

William D. Robbins, 37 Ridge Rd., Succasunna, N.J. 07876

Continuation of Ser. No. 241,016, Sep. 2, 1988, abandoned. This application Mar. 27, 1990, Ser. No. 499,808

Int. Cl.[5] A63B *59/06*

U.S. Cl. 273—26 B **5 Claims**



1. A toy baseball bat assembly which comprises:

a hollow cylindrically-shaped bat including a barrel portion, an intermediate tapered portion and a handle portion, said barrel portion having an opening including an end wall member and defining a magazine to receive a plurality of balls;

a launching means disposed in said barrel portion including a coil means spring mounted on an axis substantially perpendicular to the longitudinal axis of said toy bat assembly for cooperating with said end wall member to expel a ball substantially perpendicular to the longitudinal axis of said toy bat assembly;

latching assembly means for compressing said coil means spring into a cocked position and comprising first, second and third latching element means and a handle member positioned for slidable movement within said handle portion of said toy bat, said handle member being connected to said first latching element means for placing in com-

pression said coil means spring in said cocked position, said first latching element means being spring-loaded for loading to a loading position after placement of said launching assembly means into said cocked position thereby integrating said handle portion to said bat assembly, said first latching element means for driving said second latching element means, said second latching element means connected to said launching assembly means for compressing said coil means spring into said cocked position, said third latching element means for locking said second latching element means in said cocked position; and

means disposed on an upper side of said handle portion for contacting said third latching element means of said latching assembly means to release said second latching element means thereby to expel said ball from said barrel portion of said toy baseball bat assembly.

5,024,436

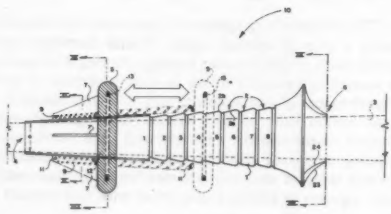
BASEBALL BAT EXERCISING DEVICE

Sammy J. Vento, 8401 Sterling Ave., Raytown, Mo. 64138

Filed Sep. 5, 1990, Ser. No. 577,562

Int. Cl.[5] A63B *69/00*

U.S. Cl. 273—26 R **8 Claims**



1. A baseball bat exercising device comprising:

(a) a sleeve having a generally cylindrical shape, said sleeve being sized to circumferentially engage a portion of a baseball bat;

(b) an annular weight, said annular weight being sized to surround said sleeve; and

(c) means to removably connect said annular weight to said sleeve and provide a resistive force against said annular weight traveling longitudinally along said sleeve,

(d) whereby said annular weight travels longitudinally along said sleeve when a said baseball bat is swung by a user and provides exercise for said user.

5,024,437

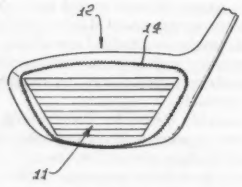
GOLF CLUB HEAD

Donald A. Anderson, Huntington Beach, Calif., assignor to Gear Fit Golf, Inc., Huntington Beach, Calif.

Continuation-in-part of Ser. No. 364,698, Jun. 12, 1989, abandoned. This application Mar. 13, 1990, Ser. No. 492,973

Int. Cl.[5] A63B *53/04*

U.S. Cl. 273—78 **1 Claim**



1. A golf club head comprising:

a) a main body portion formed by a steel casting,

b) a face plate formed of forged steel, and having a periphery, and

c) weld means joining said periphery of said face plate to said main body portion to form a high strength, forged face plate for said golf club head,

d) said main body portion having a recessed portion into which the periphery of the face plate is fitted, said weld means joining said face plate to said main body portion comprising weld joint structure formed along the periphery of said face plate and welding said face plate periphery to said recessed portion, and said weld means extending along the periphery of the face plate in looping configuration, and said weld means and face plate extending substantially to the bottom level of the head, and to the toe and heel of the head,

e) said weld means having generally trapezoidal configuration, with top and bottom elongated and curved extents; the top curved extent being upwardly convex, and the bottom curved extent being downwardly convex.

5,024,438

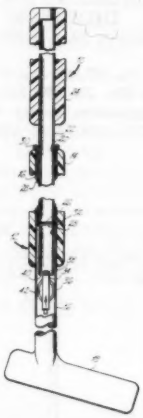
DETACHABLE GOLF PUTTER EXTENSION

A. J. Candow, 2721 Riverbluff Ct., Villa 99, Sarasota, Fla. 34231

Filed Apr. 6, 1990, Ser. No. 505,835

Int. Cl.[5] A63B *53/14*

U.S. Cl. 273—81 R **2 Claims**



1. Apparatus for modifying a golf putter to provide a readily attachable and detachable putter shaft extension; the putter having a hollow shaft with a club head at one end and extending to a second end, a grip enclosing a portion of the hollow shaft extending from the second end towards the club head, and the grip having a hole in the end thereof exposing the hollow shaft end; comprising:

a putter modifying portion having a female ferrule sized to fit within the golf putter hollow shaft;

said female ferrule having a smooth, cylindrical inner surface extending from a first open end to a second end;

a flange element extending outwardly from said female ferrule first open end diametrically sized to extend at least over the golf putter hollow shaft at the second end of the golf putter hollow shaft, whereby said female ferrule first open end cannot extend into the gold putter hollow shaft;

said second end of said female ferrule, having an inwardly extending portion of reduced cross-sectional diameter with a threaded fastener shaft hole centrally located therein;

an anchor having a connection to said second end of said female ferrule;

said anchor having a portion expandable against the golf

putter hollow shaft upon insertion of a threaded fastener through said threaded fastener shaft hole and into said anchor;

said putter shaft extension portion having a straight shaft with a first end formed as a male ferrule having a smooth outer surface fixed to fit snugly within said female ferrule;

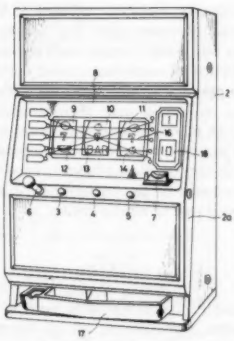
said putter extension shaft extension grip connected over said putter extension shaft extending from said second end toward first end and ending above said male ferrule, whereby when said male ferrule is placed in said female ferrule said putter extension shaft will be coaxial with said putter hollow shaft.

5,024,439

SLOT MACHINE

Kazuo Okada, Tokyo, Japan, assignor to Kabushiki Kaisha Universal, Tokyo, Japan

Filed Aug. 21, 1990, Ser. No. 570,593
Claims priority, application Japan, Aug. 21, 1989, 1-214595
Int. Cl.[5] A63F *5/04*
U.S. Cl. 273—143 R **8 Claims**



1. A slot machine having a plurality of series of symbols movable past a viewing window during the playing of a game, comprising:

hit determining means for determining before said symbol series stop moving whether said game can be a hit; and

speed setting means responsive to said hit determining means for changing the speed of movement of at least one of said symbol series in accordance with a determination made by said hit determining means so that the possibility of said hit can be visually suggested while the symbols are still moving.

5,024,440

DICE A WORD

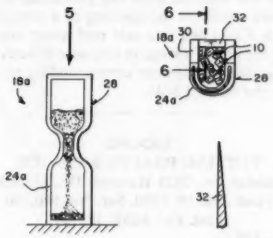
Max B. Tidalgo, 12003 Alondra Blvd., Norwalk, Calif. 90650, and George Spector, 233 Broadway, New York, N.Y. 10007

Filed Mar. 5, 1990, Ser. No. 487,867
Int. Cl.[5] A63F *9/04*
U.S. Cl. 273—145 A **2 Claims**

1. A word building game comprising:

(a) a plurality of playing cubes, each said cube having a letter with a score value on each side thereof; and

(b) means for timing the play of the game for a pre-set time after said cubes are cast upon a flat surface, so that a player can form at least one word from the letters on the top sides of said cubes and then add up the score values; further including a box-shaped container having a hinged lid for holding all of said playing cubes and said timing means therein; wherein said timing means includes an hourglass shaped timer to form a half portion of a housing,



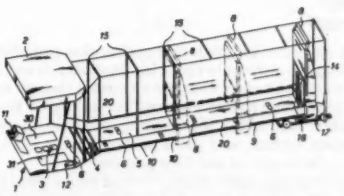
in combination with an other half portion of said housing having means for holding and casting said cubes.

5,024,441

GOLFCOURSE SIMULATOR DEVICE

Claude Rousseau, 24 rue Sainte Félicité, 75015 Paris, France

Filed Apr. 5, 1989, Ser. No. 333,258
Claims priority, application France, Apr. 7, 1988, 88 04617
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—176 R **18 Claims**



1. A golfcource simulator device comprising a series of holes into which a player must direct a ball in corresponding successive stages in each of which one hole constitutes a stage of objective to which the ball advances from a start area, the player playing all his strokes from the same point and the progress of the ball along the course being simulated by displacement of the objective hole according to parameters of the preceding stroke, said device comprising a driving area, a first ball sensor in said driving area, an elongated track extending from said driving area, a plurality of selectively openable and closable holes on said track, a plurality of second ball sensors each associated with a respective hole, a plurality of third ball sensors disposed along the length of said track to determine the farthest position reached by a ball on said track after a stroke, a target closing said track sat the end opposite said driving area and separating a real space between it and said driving area and a virtual space on the side of said target opposite said driving area, a plurality of impact sensors on said target and control means including a programmed computer comprising means;

defining the series of stages each corresponding to a field extending from a start area to an objective hole and subdivided into an ordered plurality of contiguous cells memorized in said computer in the form of a file comprising plurality of blocks of information each associated with a respective one of said cells of said field and each containing data for identifying the associated cell relative to the start area and the objective hole for the stage in question;

determining stroke parameters either from conditions of impact on said target or from the position of the ball on said track after the stroke according to whether the objective hole for the cell in which the origin of the stroke is simulated is in said virtual space or in said real space, respectively;

determining the cell of said field in which the ball is located

after a stroke from the stroke parameters and the cell reached after the preceding stroke;

retrieving from said file objective parameters associated with the cell reached after the preceding stroke, which parameters condition the opening of a particular hole on said track if said cell is in said real space; and

registering the end of a stage in response to activation of one of said second ball sensors corresponding to entry of the ball into the opened hole.

5,024,442

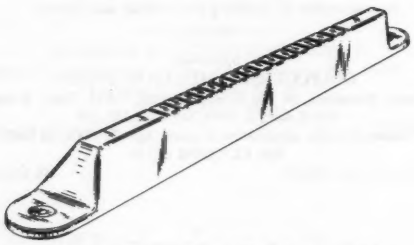
PUTTING PRACTICE DEVICE

Joseph L. Sindelar, Sr., 2121 Hancock Dr., Horseheads, N.Y.

Filed Jun. 19, 1990, Ser. No. 540,350

Int. Cl.[5] A63B *69/36*

U.S. Cl. 273—186 C **21 Claims**



9. An apparatus for practicing golf strokes comprising:

an elongated element having a longitudinal axis and first and second longitudinal ends, the elongated element including a base portion having a bottom face and a club head guide portion and means for securing said base portion to a putting surface, said guide portion having a length less than the length of said base portion;

means defining a substantially vertical longitudinal side face on said guide portion extending along at least substantial portion of the length of said guide portion, said vertical side face being defined in a plane disposed at an angle of substantially 90° with respect to a plane of said bottom face of said base portion;

means defining an inclined longitudinal side face extending along at least a substantial portion of the length of said guide portion, said inclined side face having a length substantially co-extensive with said vertical side face and being defined in a plane disposed at an angle of less than 90° with respect to the plane of said bottom face of said base portion;

whereby, when said vertical side face is aligned with a target, the heel of a putter can be placed against and guided along said vertical side face so as to practice a straight method stroke and, when said inclined longitudinal side face is aligned with the target, the heel of a putter can be guided rearwardly, inwardly and upwardly along the inclined side face and forwardly, inwardly and upwardly along the inclined side face so as to practice an in to in method stroke.

5,024,443

ATHLETIC SWING PRACTICE APPARATUS

Miro D. Bellagamba, 5161 Vineland Rd., Orlando, Fla. 32811

Filed Nov. 26, 1990, Ser. No. 618,381

Int. Cl.[5] A63B *69/36, 21/04, 21/12*

U.S. Cl. 273—188 R **7 Claims**

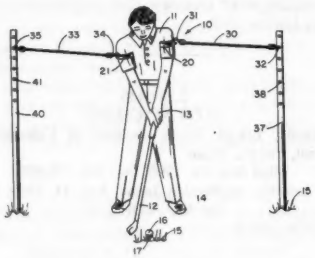
1. An athletic swing practice apparatus comprising:

a pair of flexible arm encircling straps shaped to encircle the upper arm of an athlete during a practice swing;

an elastic strap extending from each of said pair of flexible arm encircling straps, each elastic strap having an elongated piece of cooperating hook or loop material attached thereto for interlocking with each other and attaching elastic straps together to form a single elastic strap connecting said pair of flexible arm encircling straps together by a predetermined distance;

a fastener member attached to each of said flexible arm encircling straps;

a pair of elastic cords, each said elastic cord having a fastener member attached to one end thereof removably attaching each said cord to one said, fastener member of said flexible arm encircling, straps; and



a pair of stationary members adapted to be positioned a predetermined distance apart and having means for attaching one said elastic cord to each stationary member at one end portion of each elastic cord member whereby a person can practice an athletic swing with each arm having an arm encircling strap thereon connected to each other by said pair of connected elastic straps extending across the person's back to place a predetermined force between the arms while a predetermined force is applied to the movement of the upper body during an athletic swing by said pair of elastic cords.

5,024,444

GOLF BALL

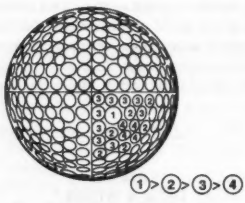
Hisashi Yamagishi; Shinichi Kakiuchi, both of Yokohama, and Seisuke Tomita, Tokorozawa, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Nov. 9, 1989, Ser. No. 435,207

Claims priority, application Japan, Dec. 2, 1988, 63-305561

Int. Cl.[5] A63B *37/12*

U.S. Cl. 273—232 **7 Claims**



1. A golf ball, comprising:

a plurality of dimples disposed about the spherical surface of the golf ball, wherein said plurality of dimples includes at least three types of dimples, said plurality of dimples having a total dimple surface area quotient Dst of at least 4, wherein the total dimple surface area quotient Dst is defined as:

$$Dst = \frac{n \sum_{k=1}^{n} [(Dmk^2 + Dpk^2) \times Vok \times Nk]}{4R^2}$$

wherein n is a positive integer of at least 3,

Group k is one of a plurality of discrete dimple groups covering the spherical surface of said golf ball,

Nk is the number of dimples belonging to a group k, wherein k is 1, 2, 3, . . . , through n,

Dmk is the diameter of dimples belonging to a selected group k,

Dpk is the depth of dimples belonging to a selected group k,

R is the radius of the ball, and

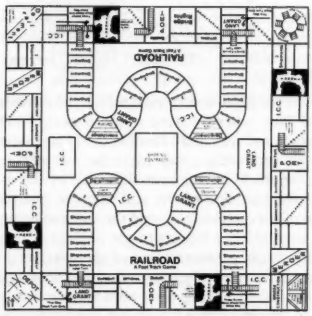
Vo is a value obtained by dividing the volume of the dimple space defined between the surface of each dimple and a plane defined by the periphery of each dimple by the volume of a cylinder having said plane defined by the periphery of each dimple as its base and the maximum depth of each dimple as its height.

5,024,445

METHOD OF PLAYING A BOARD GAME

John D. Boelter, Jr., 1114 Benton Way, Arden Hills, Minn. 55112

Filed Sep. 9, 1985, Ser. No. 774,131
Int. Cl.[5] A63F *9/04*
U.S. Cl. 273—256 **6 Claims**



1. A method of playing a board game in which a move comprises the steps of:

a. placement of one or more stop abridgement means, the stop abridgement means permitting avoidance of any consequences of the stop over which it is placed;

b. operating a means to generate the number of steps to be traversed during the move by a player's marker; and, if the stop abridgement means is traversed;

c. removing the stop abridgement means from play and avoiding the consequences of the stop on which it was placed.

5,024,446

INDICATING MEANS FOR TETHERBALL GAME

Neville M. Norman, 90 Sandyhurst La., Ashford, Kent, United Kingdom

Filed Jul. 3, 1990, Ser. No. 547,588
Int. Cl.[5] A63B *67/00*
U.S. Cl. 273—413 **6 Claims**

1. Apparatus for a tetherball game including:

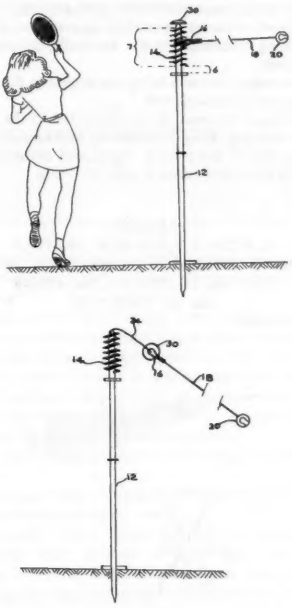
a vertically mounted pole;

a ball;

a line connecting the ball to the pole;

a line attachment at the end of the line remote from the ball which couples the line to a helical guide on the pole and which is free to rotate about the helical guide to move up or down the helical guide depending on the direction in which the ball is struck; the helical guide being free at either end to permit the line attachment to emerge from the helical guide; and

characterised by the inclusion of means to divert the line attachment from a terminal position on the helical guide to a temporary captive position immediately upon the line



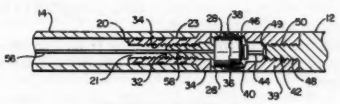
attachment emerging from the helical guide, the captive position being displaced from the axis of the helical guide.

5,024,447

TRANSMITTER IN ARROW

Arthur D. Jude, 7821 E. Dublin, Granville, Ohio 43054

Continuation-in-part of Ser. No. 822,779, Jun. 9, 1986, abandoned. This application Sep. 11, 1989, Ser. No. 405,761
Int. Cl.[5] F42B *6/04*
U.S. Cl. 273—416 **6 Claims**



1. In the combination of an arrow, a transmitter and means forming an antenna for transmitting a signal from the transmitter, the improvement including:

(a) the arrow including an arrowhead connected to one end of a hollow aluminum shaft and fletchings at the other end of said shaft,

(b) the antenna means comprising a primary antenna and a secondary antenna,

(1) said primary antenna comprising the aluminum shaft and

(2) said secondary antenna connected to the transmitter and extending from near the arrowhead into the hollow shaft,

(c) the transmitter being located in means forming an electrically, conducting housing, said housing being electrically connected to the shaft,

(d) said arrowhead being threaded into one end of an inter-

nally threaded connection means, said internally threaded connection means being threadedly connected to said transmitter housing means,

(e) a longitudinally reciprocable push rod in said internally threaded connection means, said push rod being configured to move longitudinally to push a battery into electrical contact with the transmitter in response to an arrowhead being threaded into the internally threaded connection means,

(f) the secondary antenna being connected to the transmitter through said housing, and

(g) the primary antenna, being connected to the transmitter by the housing being threaded to said connection means on the end of the hollow shaft, said connection means being in electrical contact with the shaft.

5,024,448

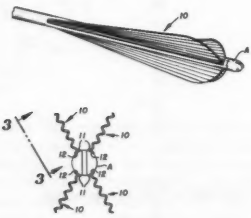
FLEXIBLE VANE FOR ARROWS

Robert L. Barrie, #2 Knoll Dr., Waseca, Minn. 56093

Filed Sep. 21, 1989, Ser. No. 410,300

Int. Cl.[5] F42B 6/06

U.S. Cl. 273—423 **9 Claims**



1. A collapsible vane for attachment to an archery arrow including:

a. a first mounting member of a predetermined length providing a forwardmost and a rearmost end having an arcuately formed lower surface which conforms to the diameter of the arrow to which the vane will be attached;

b. the collapsible vane extending from said forwardmost end of said lower mounting member surface to the rearmost end thereof and increasing in radial dimension from said forwardmost end to a point spaced from said rearmost end;

c. the collapsible vane including a plurality of pleated, convolute section arranged and constructed to compress radially when a compressive force is applied to the outermost of said sections; and,

d. each of the convolutes extending from the forwardmost end of said mounting member toward the rearmost end thereof.

5,024,449

SEAL ASSEMBLY FOR USE WITH AN OVERHANG

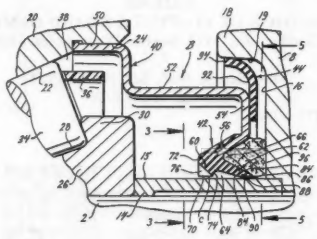
Dennis L. Otto, Carroll County, Ohio, assignor to The Timken Company, Canton, Ohio

Continuation-in-part of Ser. No. 124,814, Nov. 23, 1987, Pat. No. 4,819,949, which is a continuation-in-part of Ser. No. 79,175, Jul. 29, 1987, Pat. No. 4,770,548, which is a continuation of Ser. No. 811,657, Dec. 19, 1985, abandoned. This application Apr. 6, 1989, Ser. No. 334,448

Int. Cl.[5] F16J 15/32, 15/34

U.S. Cl. 277—37 **18 Claims**

1. In combination with a circular sealing surface which is located around an axis of rotation with its center at the axis and an overhang which extends around the sealing surface concentrically with respect to that surface, yet is spaced outwardly from the surface and is fixed in position with respect to it,. an improved bal for establishing a barrier along the sealing surface and overhang while relative rotation occurs between the sealing surface and the seal, said seal comprising: a generally rigid case mounted concentrically with respect to the sealing surface, yet such that relative rotation can occur between the sealing surface and case; a first lip carried by the case and being presented toward and along the sealing surface to create a barrier to the passage of lubricant along the sealing surface, the first lip having an end face which is located at a substantial angle with respect to the axis of rotation and a circumferential face which is presented around and toward the sealing surface and intersects the end face at an edge, the circumferential face being generally separated form the sealing surface, the first lip having pumping cavities which open out of the end face and the circumferential face and interrupt the edge, the cavities being configured to impel lubricant which enters them gener-



ally axially in the direction toward which the cavities open out of the end face when relative rotation occurs between the sealing surface and seal; and a flexible shield carried by the case and directed outwardly away from the axis and toward the overhang, the shield having been deflected by the overhang as a result of the insertion of the seal into the overhang or the installation of the overhang around the seal and being along the overhang to establish a barrier to the passage of contaminants along the inwardly presented face of the overhang, the shield being formed form an elastomer that has low resistance to abrasion, the shield having been abraded significantly by the overhang to the extent that it does not contact the overhang or else bears against the overhang with a very light force, whereby the shield conforms generally to the inwardly presented surface of the overhang.

5,024,450

SEAL CARTRIDGE ASSEMBLY

Erwin T. Hawley, and Gregory S. Kladden, both of Indianapolis, Ind., assignors to Rexnord Corporation, Milwaukee, Wis.

Filed Dec. 5, 1989, Ser. No. 446,204

Int. Cl.[5] F16J 15/34

U.S. Cl. 277—37 **14 Claims**

1. A seal cartridge assembly for providing a seal between a non-rotatable member having an axial bore and a rotatable shaft mounted within the axial bore, including in combination:

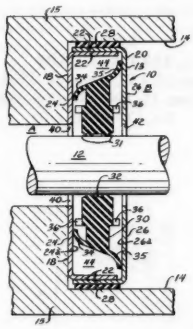
a housing comprised of a pair of annular case members, each case member including an outer peripheral wall portion and having an annular flange portion extending radially inwardly from said outer peripheral wall portion, with the outer peripheral wall portion of each case member press fit together in overlapping relationship to provide a substantially U-shaped housing, with said annular flange portions defining aligned annular seal facings,

single member annular seal means extending around and contacting only the outer peripheral wall portion of said case members, with said housing and said annular seal means being adapted to be press fit and sealed to the axial bore of the non-rotatable member, and

an annular sealing ring positioned within said housing and adapted to be positioned about said rotatable shaft and rotatable therewith, a first flexible lip formed on said annular sealing ring extending obliquely and radially in-

wardly from the body of said sealing ring to resiliently engage an annular seal facing of said housing to provide a seal therebetween,

a second flexible lip formed on said annular sealing ring extending obliquely and radially outwardly from the body



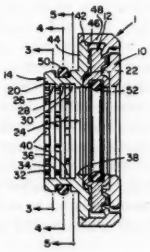
of said sealing ring to resiliently engage the other of said annular seal facings of said housing to provide a seal therebetween, whereby said first and said second lip extensions of said sealing ring are effective at times to prevent fluid flow through the seal cartridge assembly.

5,024,451

MULTI-POSITION LABYRINTH SEAL RING

Richard Borowski, Victor, N.Y., assignor to Garlock Inc., New York, N.Y.

Filed Jul. 5, 1990, Ser. No. 548,699
Int. Cl.[5] F16J *15/34*
U.S. Cl. 277—53 **19 Claims**



1. A labyrinth ring comprising

(a) an axially inner end,

(b) an axially outer end,

(c) an internal bore,

(d) a series of radial lands and grooves formed in said bore at said inner end,

(e) a plurality of axial drainage grooves extending across said lands at spaced intervals around the inner periphery of said lands to join said radial grooves, said axial grooves in adjacent lands being rotationally offset from one another sufficiently that none of said axial grooves extends continuously across more than two adjacent radial lands, and

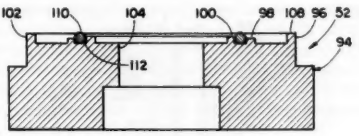
(f) at least one radial land at said axially outer end having no axial grooves extending thereacross.

5,024,452

REACTOR COOLANT PUMP HAVING THERMALLY STABILIZED HYDROSTATIC SEALING ASSEMBLY

Charles D. Bice, Clinton Township, Butler County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 16, 1990, Ser. No. 466,143
Int. Cl.[5] F16J *15/38*
U.S. Cl. 277—81 R **18 Claims**



1. A hydrostatic sealing assembly, comprising:

(a) a pair of sealing parts mountable for undergoing relative rotation;

(b) at least one of said sealing parts including an annular support member and an annular faceplate member mountable to said support member, said members having respective one sides adjacent to and spaced from one another, one of said support and faceplate members having a sealing surface at its one side adjacent to and spaced from said one side of said other of said members;

(c) said other of said support and faceplate members including

(i) an annular body having radially spaced outer and inner circumferential edges,

(ii) an outer raised circumferential rib defined on said annular body adjacent to said outer circumferential edge thereof at said one side of said other member for engagably supporting said one member at said adjacent side thereof when said faceplate member is mounted to said support member,

(iii) an inner raised circumferential rib defined on said annular body adjacent to said inner circumferential edge thereof at said one side of said other member for retaining a separate sealing element between the respective one adjacent sides of said faceplate and support members,

(iv) an annular flexible sealing element separate from and disposed on said annular body adjacent to and about said inner rib thereon; and

(v) an annular recessed cavity defined in said annular body at said adjacent side of said other member between said outer and inner ribs for substantially spacing said faceplate member from said support member at said respective one adjacent sides thereof to thermally insulate said faceplate member from said support member;

(vi) said sealing element having a cross-sectional diameter greater than the height of said inner rib so as to project from said one side of said other member, beyond said inner rib, and toward said adjacent side of said one member for sealably engaging said one member at said adjacent side thereof as said outer rib engagably supports said one member at said adjacent side thereof.

5,024,453

LIVELOAD ASSEMBLY FOR ROTARY OR RECIPROCATING SHAFT PACKING

Steven M. Suggs, Atlanta, Ga., assignor to Pressure Services, Inc., Doraville, Ga.

Filed Dec. 20, 1988, Ser. No. 287,079
Int. Cl.[5] B65D *53/00*; E21B *33/00*; F16J *15/00*; F16B *43/02*
U.S. Cl. 277—106 **15 Claims**

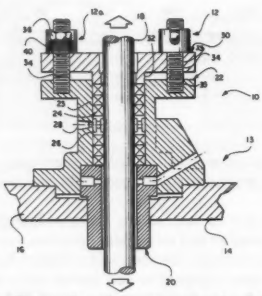
1. A liveload assembly for positioning on a bolt extending from a stuffing box of a fluid flow apparatus and securing to the bolt with a nut, for communicating force to an axially

translatable gland follower which compresses packing held in the stuffing box, comprising:

a stack guide having an open top and a bottom defining an aperture for receiving the bolt to position the liveload assembly against the gland follower;

a plurality of compressed belleville washers stacked inside the stack guide; and

a retainer operably engaged with the stack guide for holding



the belleville washers in a compressed relationship independent of the nut,

whereby the compressed force of the belleville washers is applied to the gland follower when:

the nut is threaded on the bolt and brought into contact with the stack of belleville washers to secure the liveload assembly to the gland follower, and

the retainer is disengaged from holding the belleville washers.

5,024,454

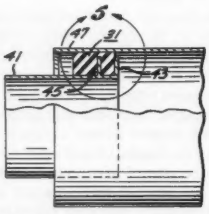
COMPENSATING SEAL

Kenneth J. McGilp, 10675 East Ave., Hesperia, Calif. 92345; Stephen N. Affa, 14644 Camelia Hill, Canyon Country, Calif. 91351, and Ira R. Newman, 10224 Falun Dr., Sun Valley, Calif. 91352

Continuation of Ser. No. 89,269, Aug. 25, 1987, abandoned. This application Jun. 30, 1989, Ser. No. 374,532

Int. Cl.[5] F16L *21/02*

U.S. Cl. 277—207 A **7 Claims**



1. An integral ring shaped seal for effecting sealing between telescoped inner and outer tubular members, comprising, in combination:

a body of flexible elastomer material;

at least a portion of said body adapted to fit between a pair of spaced apart flanges carried by one of said members with said flanges extending toward but terminating short of the other of said members;

an integral peripheral protrusion about the body extending outwardly thereof in the direction of the other member for resilient engaging contact therewith;

a compensating groove in the body adjacent said one member and opposite the protrusion whereby telescoping said members together squeezes the protrusion in a direction inwardly of the body permitted by alteration of the shape of the compensating groove to seal the telescoped members against both high pressure and low pressure leakage; and,

said body extending longitudinally beyond said flanges along the flanged member and that flange which is innermost on the member carrying the flanges thereby locking the seal in sealing position.

5,024,455

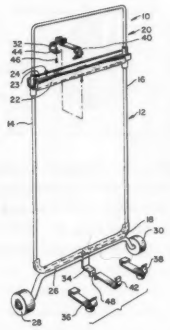
LUGGAGE CART

Ray B. Schrecongost, 2412 W. Sibley St., Park Ridge, Ill. 60068

Filed Jun. 11, 1990, Ser. No. 535,908

Int. Cl.[5] B62B *1/04*

U.S. Cl. 280—37 **9 Claims**



1. A wheeled cart for transporting luggage having a first part with an exterior wall and a rim having a cross-sectional contour and a second part with a rim, said first part and said second part being interconnected by a hinge for movement between an open position and closed position in which the rim of said first part and the rim of said second part are in abutting relation to form a compartment, the cart comprising:

a supporting structure for supporting the luggage said supporting structure having a handle;

first and second brackets attached to the supporting structure in spaced relation for receiving the luggage therebetween, each of said first and second brackets having a profiled portion which encircles and conforms to the cross-sectional contour of the rim of said first part of said luggage for hooking over the rim of said first part at opposed points, said profiled portion being sufficiently resilient to provide a reaction force for urging the exterior wall of said first part against said supporting structure; and

a pair of wheels mounted on an axle attached to said supporting structure wherein said wheeled cart permits said second part to be opened relative to said first part while said supporting structure is attached to said first part.

5,024,456

TWO UNIT FOLDING HITCH STRUCTURES

Howard C. Hadley, Des Moines, and John R. Myers, Polk City, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Jul. 12, 1989, Ser. No. 378,877

Int. Cl.[5] B60D *1/00*

U.S. Cl. 280—412 **20 Claims**

1. Hitch structure for towing first and second framed implements forwardly one behind the other in a transport position and in a generally side-by-side relationship in a field-working position, the implements each having a frame with end members and front and rear frame members, the hitch structure comprising:

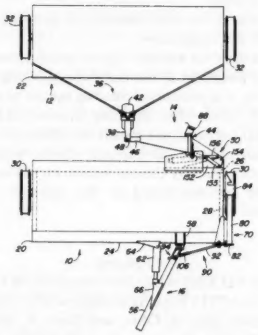
an elongated rear hitch having a forward end and a rearward

end, the rearward end adapted for connection to and towing of the second implement;

hinge means for pivotally connecting the forward end of the rear hitch to one side of the rear frame member of the first implement adjacent a corresponding end member thereof;

a fore-and-aft extending forward hitch including an aft end pivotally connected to the front frame member of the first implement at a location offset toward the one side of the implement, and a forward towing end adapted for connection to a towing vehicle;

means for rocking the forward hitch about an upright axis between a first position corresponding to the transport position, wherein the forward towing end is generally



centered with respect to the first implement, and a second position corresponding to the field-working position wherein the forward towing end is offset toward the one side generally centered between the implements, wherein the upright axis is centrally located between said corresponding end member and the center of the first implement adjacent the front frame member; and

means for rocking the rear hitch between first and second positions corresponding to the transport and field-working positions, respectively, wherein the rearward end is generally centered with respect to the first implement when the rear hitch is in the first position and is offset outwardly of the corresponding end member of the first implement when the rear hitch is in the second position.

5,024,457

SAFETY SKI BINDING

Martin Bogner, Ostfildern, Fed. Rep. of Germany, assignor to GEZE Sport International GmbH, Leonberg, Fed. Rep. of Germany

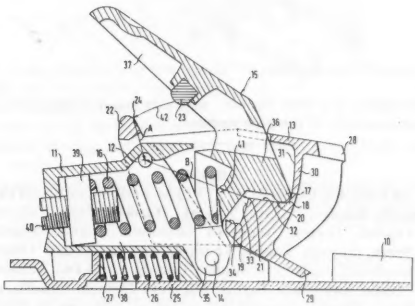
PCT No. PCT/EP89/00922, § 371 Date Mar. 26, 1990, § 102(e) Date Mar. 26, 1990, PCT Pub. No. WO90/01358, PCT Pub. Date Feb. 22, 1990

PCT Filed Aug. 3, 1989, Ser. No. 469,600

Int. Cl.[5] A63C *9/084*

U.S. Cl. 280—632 **14 Claims**

1. Safety ski binding comprising a heel unit having a bearing housing **(11)** which is secured to the ski and is preferably displaceable rearwardly against a spring force, with a sole holder **(13)** capable of pivoting between a closed position and an open position about a first transverse axle **(12)** connected to the bearing housing and with a hand opening lever capable of pivoting between a close position and an open position about a second transverse axle **(14)** connected to the bearing housing, wherein a release spring **(16)** which is braced having one end against the bearing housing **(11)** and which biases a hand opening lever **(15)** to a closed position in a closing direction relative to the second axle provided in the bearing housing and a latch projection **(17)** is movable by means of the hand opening lever **(15)** and engages in the closed position into a first latch recess **(18)** and in an open position into a second latch recess **(19)** of a cam track **(20)** arranged on the sole holder **(13)** and provides for latching of the sole holder in the closed position and in the open position, with the cam track **(20)** having a culmination point **(21)** between the first latch recess and the second latch recess, characterized in that: an actuating abutment **(22)** is arranged on the sole holder **(13)** at a distance (A) from the first transverse axle **(12)** which is clearly smaller than a distance (B) of the culmination point **(21)** from the first transverse axle **(12)**; in that a counter-abutment **(23)** which cooperates with the actuating abutment **(22)** is provided on the hand opening lever **(15)**; in that at least one of the two abutments **(22, 23)** is made resiliently yielding; and in that the hand opening lever **(15)** is pivotally arranged on the bearing housing **(11)** relative to the sole holder **(13)**, and the counter-abutment **(23)** is attached thereto, such that when the sole holder **(13)** is located in the



closed position and when the hand opening lever is moved from the closed position into an open position, said hand opening lever first engages the actuating abutment **(22)** and then moves the sole holder **(13)** in the opening direction with an angular speed in relation to the first transverse axle **(12)** which is increased relative to the actual angular speed of the hand opening lever **(15)**, in correspondence to the different distances (A, B) and the instantaneous phase of a circular movement of the hand opening lever **(15)**, until the latch projection again contacts the cam track **(20)** prior to reaching the culmination point **(21)**, whereupon the latch projection **(17)** slides with compression of the at least one resilient abutment over the culmination point **(21)** and the sole holder **(13)** springs into an over dead point position, wherein the counter-abutment **(23)** is resilient and the actuating abutment **(22)** is rigid.

5,024,458

PORTABLE LUGGAGE CARRIER WITH PIVOTABLE WHEELS

Eugene A. Kazmark, 5 Remin La., and Eugene A. Kazmark, Jr., 506 Manhattan Rd., both of Joliet, Ill. 60433

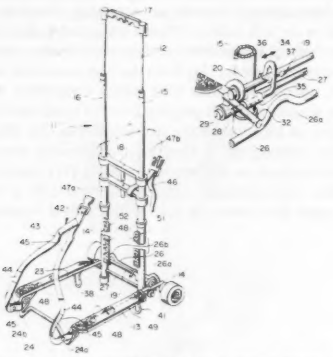
Filed Feb. 7, 1990, Ser. No. 476,311

Int. Cl.[5] B62B *1/12*

U.S. Cl. 280—645 **12 Claims**

8. A portable luggage carrier comprising: a handle member having a first and second end; a grip means disposed at the first end of the handle member; a base member pivotally connected to the handle member at the second end of the handle member for supporting luggage; wheel means disposed at the second end of the handle member for rolling on a subtending surface; axle means disposed at the second end of the handle member for supporting the wheel means, said wheel means being rotatably mounted on the axle means, said axle means defining an axis of rotation for said wheel means, said axle means being pivotally mounted to said handle member; and a movable first

latching means secured tot he second end of the handle member for engaging the axle means and releasably securing the



axle means in a first location; said axle means being movable independently of the base member.

5,024,459

PRESSURE CONTROL SYSTEM FOR SUSPENSION

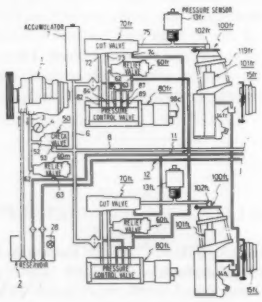
Kouichi Kokubo, Nagoya; Toshiaki Hamada, Toyota; Shinichi Tagawa, Toyota; Nobuyasu Suzumura, Toyota; Shuuichi Buma, Toyota; Toshio Aburaya, Toyota; Toshio Onuma; Kunihito Sato, both of Susono; Takashi Yonekawa, Mishima; Masaki Kawanishi, Toyota; Hiroyuki Ikemoto, Susono, and Kaoru Ohashi, Okazaki, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota and Aisin Seiki Kabushiki Kaisha, Kariya, both of, Japan

Filed Dec. 27, 1989, Ser. No. 457,957

Claims priority, application Japan, Dec. 28, 1988, 63-331041; Feb. 13, 1989, 1-33462; Aug. 28, 1989, 1-221240; Aug. 31, 1989, 1-226222

Int. Cl.[5] B60G *17/00*

U.S. Cl. 280—707 **12 Claims**



1. Pressure control system for suspension comprising

a pressure source for supplying a fluid which is drawn from a reservoir to a high pressure piping under a high pressure which delivers a hydraulic fluid to a suspension which is adapted to extend and shrink in response to a pressure supplied thereto;

a pressure control valve including a line pressure port communicating with the high pressure piping, a low pressure port communicating with a low pressure, an output port for delivering a pressure to the suspension, a target pressure space communicating with the high pressure piping through an orifice, a spool responsive to a pressure from the output port applied to its one end to be driven in a direction to reduce a degree of communication between the line pressure port and the output port and to increase a degree of communication between the low pressure port and the output port and also responsive to a pressure from the target pressure space applied to its other end to be driven in a direction to increase a degree of communication between the line pressure port and the output port and to reduce a degree of communication between the low pressure port and the output port, a valve element for defining a degree of communication between the target pressure space and the low pressure, and electrical drive means for driving the valve element in a direction to increase/decrease the degree of communication;

pressure detecting means for detecting a pressure in the high pressure piping;

command means for commanding a pressure value to be applied to the suspension;

correction means for correcting the pressure value from the command means in a manner dependent on the pressure detected by the pressure detecting means so as to increase the output value when detected pressure is low;

and electrical energization means for electrically energizing the pressure control valve in accordance with the pressure value as corrected by the correction means so as to deliver a pressure corresponding to the pressure value to the suspension.

5,024,460

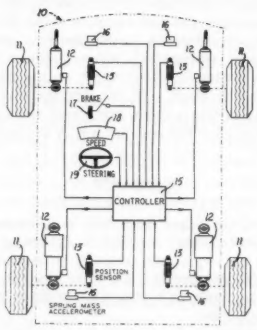
OUTPUT FILTER AND METHOD FOR ON/OFF SEMI-ACTIVE SUSPENSION CONTROL

Reed D. Hanson, Dayton, Ohio, and Scott T. Radcliffe, West Lafayette, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 26, 1989, Ser. No. 454,309

Int. Cl.[5] B60G *17/04*

U.S. Cl. 280—707 **4 Claims**



1. A suspension control for a vehicle having a body and a road contacting wheel connected by a damper effective to apply a damping force therebetween, the damper including apparatus including a valve switchable in response to a binary filtered damper signal at frequencies within a desired activation frequency range between a first mode of operation characterized by a low damping force, in response to a first value of the filtered damper signal, and a second mode of operation having a high damping force, in response to a second value of the filtered damper signal, the suspension control comprising:

first means effective to repeatedly derive from one or more sensed vehicle suspension related operating variables, at a rate significantly greater than the desired activation frequency range, a binary unfiltered damper signal comprising a first value or a second value;

a timer active for a predetermined time after a reset and otherwise inactive; and

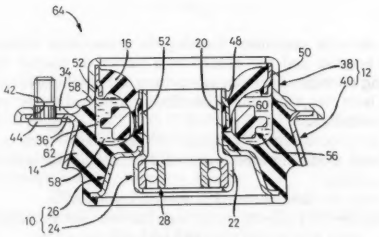
filter apparatus effective to derive the filtered damper signal from each successive unfiltered damper signal by (1) resetting the timer each time the unfiltered damper signal changes value, (2) causing the filtered damper signal to be the same value as the unfiltered damper signal while the timer is inactive, and (3) maintaining the filtered damper signal value unchanged while the timer is active, whereby unnecessary high frequency switching of the valve is reduced but the damper responds without unnecessary delay to signals within the desired activation frequency range.

5,024,461

UPPER SUPPORT FOR SHOCK ABSORBER IN SUSPENSION SYSTEM, HAVING ELASTICALLY SUPPORTED RESONANCE MEMBER

Shinji Miyakawa, Komaki, and Michio Ito, Inuyama, both of Japan, assignors to Tokai Rubber Industries, Ltd., Aichi, Japan

Filed Jul. 20, 1990, Ser. No. 554,876
Claims priority, application Japan, Jul. 25, 1989, 1-87007[U]
Int. Cl.[5] B60G *11/62*; F16F *13/00, 15/04*
U.S. Cl. 280—710 **14 Claims**



1. An upper support for a suspension system, which is interposed between a body of a vehicle and a shock absorber of the vehicle, for elastically connecting the vehicle body and the shock absorber, comprising:

a generally cylindrical inner rigid member to which said shock absorber is fixed;

a generally cylindrical outer rigid member which is disposed radially outwardly of said inner rigid member and fixed t said body of the vehicle;

at least one generally annular elastic body interposed between said inner and outer rigid members for elastically connecting the inner and outer rigid members, said at least one elastic body defining a generally annular fluid chamber between the inner and outer rigid members, said fluid chamber being filled with a non-compressible fluid;

an annular resonance member which is accommodated in said fluid chamber, and which is supported by one of the inner and outer rigid members so as to radially extend toward the other of the inner and outer rigid members, so that said fluid chamber is substantially divided into two sections located on axially opposite sides of said resonance member, pressures of said fluid in said two sections changing relative to each other upon application of a vibrational load between said inner and outer rigid members, said resonance member having a circumferential surface which cooperates with an inner wall surface of said at least one elastic body to define a resonance portion through which said non-compressible fluid is forced to flow between said two sections upon application of the vibrational load; and

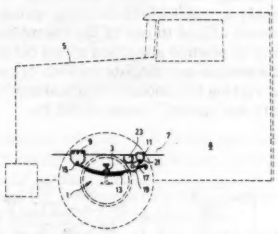
support means for elastically supporting said resonance member with respect to said one of the inner and outer rigid members, such that said resonance member can be aixally displaced relative to said one rigid member due to elastic deformation of said support means.

5,024,462

COMBINED AIR AND LEAF SPRING SUSPENSION FOR HEAVY WEIGHT VEHICLE

Daniel Assh, 1155 Turnball, Apt. 715, Quebec, Canada G1R 5G3

Filed May 9, 1989, Ser. No. 349,107
Int. Cl.[5] B60G *11/38, 11/42*
U.S. Cl. 280—712 **14 Claims**



1. A shock-absorbing suspension for a road vehicle having a body, said suspension comprising:

a transverse wheel-axle beam;

a leaf spring having a top spring leaf;

means making said beam and said spring solid with one another;

means connecting one end of said top spring leaf to the vehicle body for pivotal movement of said leaf spring about a first axis extending transversely of said vehicle body;

a load and shock transmitting lever at the other end of said leaf spring;

means mounting one end of said lever to the vehicle body for pivotal movement thereof about a second axis parallel to said first axis;

a pneumatic balloon solid with the other end of said lever and with the vehicle body said pneumatic balloon comprising:

(a) a hollow body having resilient sidewall means defining an air chamber;

(b) a heavy shock-absorbing resilient damper element within said chamber, free from said sidewall means and solid with said transmitting lever; said damper element projecting up into said chamber and terminating short of the vehicle body to define therebetween a stroke of short predetermined length;

(c) wherein both high amplitude jolting due to road irregularities, the top of said damper element butts against the vehicle body and vibrations in the leaf spring are absorbed essentially by said leaf spring whereas any low amplitude jolt is absorbed by said heavy damper element; and

load and shock transfer means interconnecting said lever and said other end of said leaf spring solidly through said top spring leaf to transfer loads and shocks from said leaf spring to said lever.

5,024,463

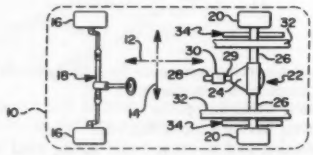
MANUALLY POWER MECHANICAL ACTUATOR FOR PARALLEL AUXILIARY SPRING

James L. Oliver, Pontiac; James A. Juriga, Bloomfield Hills; Erlen B. Walton, Farmington Hills, and David M. Preston, Drayton Plains, all of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Dec. 26, 1989, Ser. No. 456,872
Int. Cl.[5] B60G *11/02, 11/00*
U.S. Cl. 280—718 **25 Claims**

1. A vehicle comprising left and right ground engaging wheel mechanisms rotatably mounted on opposite ends of an axle assembly extending transverse to a longitudinal axis of a vehicle chassis assembly having front and rear ends; main spring means vertically supporting the chassis assembly on the

axle assembly, the main spring means include first and second transversely spaced apart and generally longitudinally extending main leaf springs each having opposite ends in load supporting relation with the chassis and each having an intermediate portion affixed to the axle assembly; first and second transversely spaced apart and generally longitudinally extending auxiliary leaf springs each having a first and a second end respectively attached to the chassis and axle assemblies, the auxiliary leaf springs for vertically supporting the chassis on the axle assembly in parallel with the main spring means; and an actuator means affixed to one of the assemblies and selectively operative to position a reaction means between the one assembly and a portion intermediate the ends of each auxiliary leaf spring for varying the amount of vertical support provided by the auxiliary leaf springs; characterized by:



the auxiliary leaf springs being of the single leaf type,

bracket means rigidly affixed to the axial assembly for pivotally attaching the second ends of the auxiliary leaf springs and rigidly attaching the intermediate portions of the main leaf springs to opposite sides of the axial assembly relative to the vertical; and

the actuator means includes at least one speed reduction gear assembly disposed in housing means affixed to the one assembly, the gear assembly including an input gear drivingly connected to a manually driven drive, an output gear driven by the input gear, the output gear drivingly connected to the reaction means and operative to move the reaction means into and out of contact with the portion of each auxiliary leaf spring in response to to-and-fro rotation of the manually driven drive.

5,024,464

VIBRATION SUPPRESSION APPARATUS FOR STEERING WHEEL WITH AIR BAG

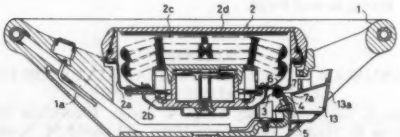
Masaaki Kawaguchi; Tomio Okamuro, and Keiichi Shirose, all of Utsunomiya, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 3, 1989, Ser. No. 388,873

Claims priority, application Japan, Aug. 8, 1988, 63-104032[U]

Int. Cl.[5] B60R *21/16*

U.S. Cl. 280—731 **4 Claims**



1. A vibration suppression apparatus for a steering wheel having an air bag unit attached to the steering wheel body, the air body unit including a gas generator and a bag, characterized in that at least part of said air bag unit is attached to said steering wheel body through a resilient means, wherein a casing for accommodating said bag of said air bag unit is rigidly secured to said steering wheel body, said gas generator being attached to said casing through said resilient means.

5,024,465

AXLE SUSPENSION FOR VEHICLES, PARTICULARLY HEAVY VEHICLES WITH TWO OR MORE AXLES

Walter Baiker, Chälenstrasse 2, 8433 Weiach, Switzerland

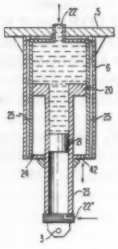
PCT No. PCT/CH88/00032, § 371 Date Dec. 7, 1988, § 102(e) Date Dec. 7, 1988, PCT Pub. No. WO88/06106, PCT Pub. Date Aug. 25, 1988

PCT Filed Feb. 9, 1988, Ser. No. 271,756

Claims priority, application Switzerland, Feb. 12, 1987, 531/87

Int. Cl.[5] B60G *11/26, 11/62*

U.S. Cl. 280—840 **14 Claims**



1. An axle suspension forming the connection between an axle housing and the chassis of a heavy or special vehicle having a longitudinal axis comprising the combination of

at least two mounting tubes fixedly attached to the vehicle chassis; and

a telescopic assembly operatively associated with each of said mounting tubes, each said telescopic assembly comprising

a jacket tube enclosed in said mounting tube,

a layer of resilient, elastic material between and in contact with said jacket tube and said mounting tube,

a telescopic tube axially displaceable within said jacket tube, said telescopic tube including at one end thereof a working piston slidable within said jacket tube, and

a pivot connection at the other end of said telescopic tube connected to said axle housing such that said housing is pivotable only about an axis parallel to the longitudinal axis of said vehicle.

5,024,466

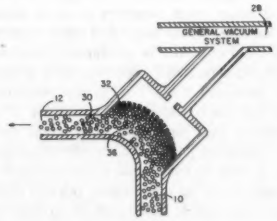
WEAR-PREVENTION STRUCTURE FOR PNEUMATIC CONVEYING PIPE ELBOW

Gregory R. Brotz, P.O. Box 1322, Sheboygan, Wis. 53081

Filed Apr. 23, 1990, Ser. No. 512,462

Int. Cl.[5] F16L *55/00*

U.S. Cl. 285—16 **1 Claim**



1. A structure for installation at the junction of two pipes at angles to one another such as are joined by an elbow having an inner wall and an outer wall, such pipes usable for pneumatically conveying particulate material, comprising:

a chamber disposed substantially along and replacing the outer wall of said elbow structure;

a curved screen member having a plurality of openings therethrough smaller than the particulate material conveyed through said structure disposed in said chamber positioned away from where the outer wall of said elbow would be disposed;

an accumulation area defined between said screen member and the former position of said outer wall of said elbow; and

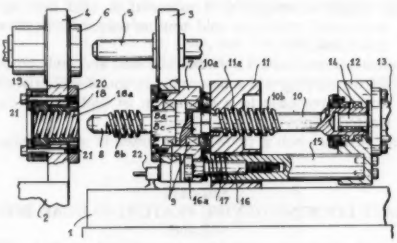
suction means disposed to the rear of said screen member to apply suction through said screen member, said suction means of sufficient strength to pull some of said particulate material against said screen member to form a particulate material accumulation in said accumulation area, said particulate accumulation forming a wear surface in place of the outer wall of said elbow, such particle accumulation being worn by particles passing through said pipes impinging on said wear surface, with worn portions of said particle accumulation being replaced by other particulate material sucked against said particle accumulation.

5,024,467

DEVICE FOR COUPLING ELEMENT-HOLDING PLATES OF MULTIPLE CONNECTIONS

Gaston Truchet, Faverges, France, assignor to S.A. des Etablissements Staubli, Faverges, France

Filed Sep. 18, 1989, Ser. No. 408,365
Claims priority, application France, Sep. 21, 1988, 88 12557
Int. Cl.[5] F16L *35/00*
U.S. Cl. 285—36 **9 Claims**



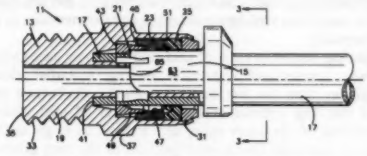
1. An apparatus for coupling opposing first and second connection elements by the axial movement of the first and second connection elements relative to one another comprising, a first plate means for supporting the first connection elements and a second plate means for supporting the second connection elements, a first threaded member carried by said first plate means and a second threaded member carried by said second plate means, said first and second threaded members being generally axially aligned and interengageable with one another, adjustment means connected to said first plate means for advancing and retracting said first plate means relative to said second plate means, means for rotating said second threaded member as said adjustment means moves said first plate means relative to said second plate means and resilient means for offsetting the advancement of said first plate means relative to said second plate means when said first and second threaded members are initially engaged until said first and second threaded members mesh with one another.

5,024,468

PUSH-IN TUBE FITTING AND RELEASE TOOL

Donald G. Burge, Plainwell, Mich., assignor to Parker Hannifin Corporation, Cleveland, Ohio

Filed Nov. 13, 1989, Ser. No. 434,194
Int. Cl.[5] F16L *35/00*
U.S. Cl. 285—39 **7 Claims**



1. An improved push-in tube fitting and release tool for releasably receiving and retaining a tube, comprising:

a metal body having:

a first end for connection to a fluid conduit;

a second end for connection to a tube;

a cavity disposed in second end of said body for receiving a tube therein;

a cylindrical tube support disposed within said tube receiving cavity for extending within and supporting a tube received in said cavity; and

a fluid conduit extending through said body from said first end of said body through said tube support;

a split gripper ring disposed in said cavity of said body radially outside of said tube support, said ring having a sharp, radially inner edge which bites into a tube once it is inserted in said cavity and through said ring; said split gripper ring provided with a cylindrical inner surface axially spaced from and having a larger inner diameter than said inner edge and oriented toward said first end and being connected to said inner edge by an inclined surface;

means for retaining said gripper ring in said cavity; and

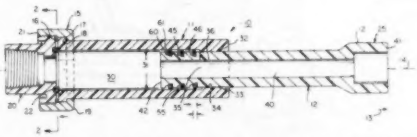
a release tool free of attachment to said body having a thin, cylindrical-section portion for being inserted between said gripper ring inner cylindrical surface and a tube gripped by said gripper ring to engage said inner cylindrical surface and to expand said gripper ring so that a tube can be thereby released from said gripper ring and removed from said tube fitting, said release tool having a length such that, when fully inserted, said cylindrical section portion does not extend between said sharp, radially inner edge of said ring and a tube retained in said body.

5,024,469

ADJUSTABLE LENGTH PIPING UNION

W. Sidney Aitken, and Ralph Gonzales, both of 2820 N. San Fernando Blvd., Burbank, Calif. 91504

Filed Feb. 23, 1990, Ser. No. 484,075
Int. Cl.[5] F16L *27/12*
U.S. Cl. 285—302 **5 Claims**



1. A piping union having a central axis, and having a length adapted to be adjustably lengthened and shortened, said union comprising:

an inner tube having a first end, a second end, an axial flow passage from end to end, an axially-extending circularly cylindrical outer wall having a diameter, said first end being adapted for connection to a next assembly, said

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5,024,470

Patent Not Issued For This Number

outer wall having, adjacent to its second end, a plurality of peripheral ring grooves, each said groove having a side wall, said side walls being axially spaced apart by a reference distance, and a bottom wall which is tapered and enlarges as it extends toward said first end;

an outer tube having a first end, a second end, and an axial flow passage from end to end having an axially extending circularly cylindrical inner wall portion having a diameter, said first end being adapted for connection to a next assembly;

an O-ring seated in each of said ring grooves, said O-rings in their unconfined condition having a radial thickness greater than the distance between the shallowest portion of the ring groove and the diameter of said inner wall portion of the outer tube, and at least as large as the distance between the deepest portion of the ring groove and the diameter of said inner wall portion of said outer tube;

said O-ring having an axial thickness less than the spacing apart of the sidewalls;

whereby said O-rings will always make a seal between said inner and outer tubes, and can shift axially in said ring grooves, making it easier to move the inner tube inwardly relative to the outer tube, than to move it outwardly relative to the outer tube;

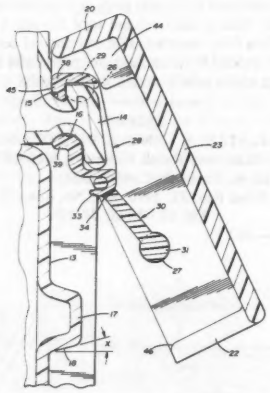
said passage in said outer tube having adjacent to its first end a cylindrical ledge of lesser diameter than the diameter of its respective inner walls, and substantially equal to the outer diameter of the inner tube to stabilize the tubes concentrically, the volume of said ring grooves being sufficient to receive the deformed O-ring as it passes through said ledge.

5,024,471

SAFETY RELEASE LATCH

W. Henry Kahl, Wooster, Ohio; David E. Price, Winfield, and Nai-Cheng Tsao, Arkansas City, both of Kans., assignors to Rubbermaid Incorporated, Wooster, Ohio

Filed Jul. 25, 1990, Ser. No. 557,965
Int. Cl.[5] E05C *3/14*
U.S. Cl. 292—97 **10 Claims**



1. In combination with a container having a base portion and a cover abutting the top thereof, the base portion having laterally spaced outward extending projections on a sidewall, a latch assembly comprising:

a latch plate having laterally spaced vertical ribs;

a transverse upper lever bar having upper and lower edges and outer ends where a portion of its upper outer ends are pivoted on said ribs thereby defining an upper pivot;

means on said upper lever bar for attachment to said cover;

a transverse lower lever bar having upper and lower edges and outer ends where a portion of its lower outer ends are pivoted on said ribs thereby defining a lower pivot, said lower lever bar also having an upper horizontal edge hinge connected to the lower edge of said upper lever bar, the centerline of said hinge being laterally offset from a plane defining both said upper and lower pivots;

means on the bottom of said latch plate for releasably engaging said projections on the base portion for latching the cover thereto;

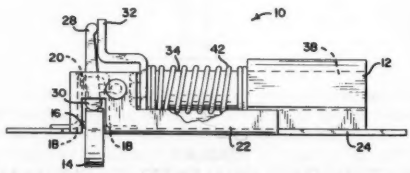
said hinge being adapted to swing over center with respect to the plane of said upper and lower pivots as the latch plate is swung to and from the latched and unlatched position.

5,024,472

FLUSHBOLT ACTUATOR ASSEMBLY

Richard B. Cohrs, Indianapolis, Ind., assignor to Von Duprin, Inc., Indianapolis, Ind.

Filed Apr. 9, 1990, Ser. No. 506,210
Int. Cl.[5] E05C *3/16*
U.S. Cl. 292—182 **16 Claims**



1. A flushbolt actuator assembly, comprising:

a housing; and

an auxiliary bolt; wherein

said auxiliary bolt is mounted in said housing for movement, relative to said housing, between (a) an extended disposition, and (b) a retracted disposition;

said housing has a longitudinal axis; and

a piston subassembly; wherein

said piston subassembly is mounted to said housing for movement, relative to said housing only, in opposite axial directions; and

means interpositioned between said bolt and said subassembly for moving said subassembly in one of said axial directions in response to a movement of said bolt to its retracted disposition; and wherein

said auxiliary bolt is pivotably mounted in said housing.

5,024,473

GATE LOCKING DEVICE FEATURING DEAD BOLT MEANS

Donald E. McQuade, 56 Jefferson St., Red Bank, N.J. 07701

Continuation-in-part of Ser. No. 310,349, Feb. 13, 1989, Pat. No. 4,919,463. This application Jan. 5, 1990, Ser. No. 461,169
The portion of the term of this patent subsequent to Apr. 24, 2007, has been disclaimed.
Int. Cl.[5] E05C *19/10*
U.S. Cl. 292—120 **17 Claims**

1. A gate locking device for a fence comprising:

(a) security box means having a mounting plate means affixed within the box;

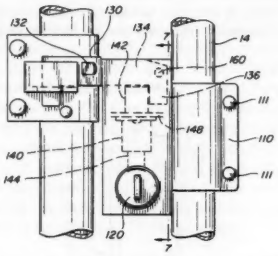
(b) mounting means for securely affixing the security box means to a first pole of the fence;

(c) an oarlock means hingeably mounted within the security box having an oarlock portion connected to a heel plate portion, the oarlock portion being capable of movement between an unlocked position and a locked position where the oarlock means receives a second pole of the fence;

(d) a dead bolt means fixedly disposed on the mounting plate within the security box having a dead bolt movable between an extended and unextended position and disposed

in mechanical relation to the heel plate so that when the dead bolt is moved to the extended position it substantially prevents the pivotal movement of the oarlock means; and

(e) barrel lock means mounted to the security box and being mechanically connected and adapted to the dead bolt means for moving it between the extended and unextended position,



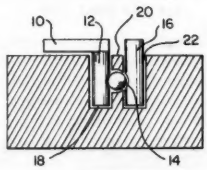
whereby when the oarlock portion is moved to the locked position and the dead bolt is moved to the extended position the oarlock portion can not be moved back to the unlocked position and the gate is securely locked to prevent unauthorized intrusion.

5,024,474

LOCKING CAM LATCH MECHANISM

Howard W. Selby, III, Boulder, Colo., assignor to Selsys Corporation, Boulder, Colo.

Filed Oct. 24, 1989, Ser. No. 425,862
Int. Cl.[5] E05C *19/00*
U.S. Cl. 292—252 **8 Claims**



1. A latch mechanism comprising:

a. a cylindrically shaped rotating cam having a cylindrical outer cam surface, and having a small radius portion and a large radius portion that ar circumferentially spaced from each other along said cam surface;

b. a bolt seated against said cam surface and movable outward relative to said cam surface when seated in said small radius portion of said cam surface and movable inward relative to said cam surface when seated in said large radius portion of said cam surface;

c. at least one latch pin with an indentation in at least one point on the outer surface into which said bolt can seat; and

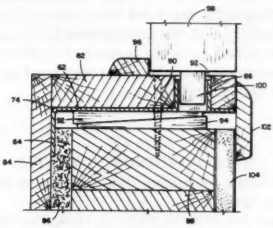
d. housing means to support and facilitate movement of said cam, said bolt and said latch pin.

5,024,475

STRENGTHENING DOOR JAMB

Charles E. Francis, Claremore, Okla., assignor to John D. Gassett, Tulsa, Okla., a part interest

Continuation of Ser. No. 197,444, May 23, 1988, Pat. No. 4,865,370, which is a continuation-in-part of Ser. No. 944,933, Dec. 22, 1986, abandoned, which is a continuation-in-part of Ser. No. 800,696, Nov. 22, 1985, abandoned. This application Jun. 5, 1989, Ser. No. 366,631
Int. Cl.[5] E05C *21/02*
U.S. Cl. 292—340 **3 Claims**



1. A method of increasing the security of a door jamb having a front side and a back side in a wall opening which has a wall stud which comprises the steps of:

obtaining a deadbolt anchoring plate having a planar member and an anchor pocket having a first open end and a second end, said second end fixed to said planar member;

cutting a hole in said jamb of a size to receive said anchor pocket;

inserting said anchor pocket through said hole from the back side of said jamb;

positioning said planar member adjacent to and in contact with the back side of said jamb and spaced from said wall stud;

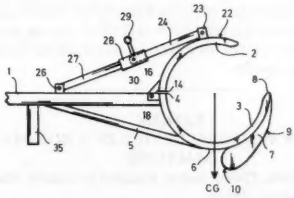
securing said planar member to said stud by at least extending a screw through said jamb from the front side thereof and on through said planar member and into said stud while maintaining said planar member against said back side of said jamb and in spaced position from said wall stud.

5,024,476

TOOL FOR HANDLING A HEAVY ELONGATE ARTICLE

Charles E. Massey, Cherry Tree House, Wragby Road, Lincoln, England

Filed Dec. 14, 1988, Ser. No. 284,946
Int. Cl.[5] B65G *7/02*; B66F *15/00*
U.S. Cl. 294—16 **5 Claims**



1. A tool for lifting a heavy metal pipe, comprising:

a handle having first and second ends and having a stop means projecting from said handle,

a pair of co-acting first and second jaw members disposed at a first end of said handle and defining a pair of conjoined recesses for receiving the article to be raised longitudinally of said jaws extending transverse to said handle, wherein the jaws are part-cylindrical and have longitudinal edges and where the jaws are hinged together at their

longitudinal edges adjacent to the handle, and wherein the conjoined recesses of said jaws are substantially cylindrical,

hand grip means provided at said second end of said handle,

fulcrum means provided on said first jaw member and projecting transverse to both said handle and the longitudinal direction of said jaws,

and means for holding said jaws together, wherein said means for holding said jaws together comprises a second handle having first and second ends and which is pivotally coupled to the first said handle intermediate to said first and second ends of both handles, said second jaw being joined to said first end of said second handle, and said second handle having hand grip means provided at said second end thereof, the arrangement being such that said first and second jaws are opened and closed by relative pivotal movement of the respective hand grip means of said first and second handles.

5,024,477

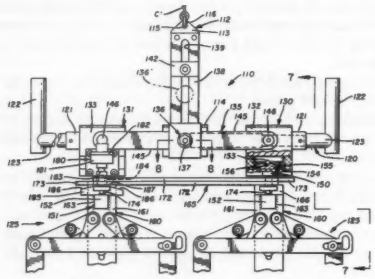
CREEL LOADING APPARATUS

Raymond J. Slezak, Barberton, Ohio, assignor to RJS Corporation, Akron, Ohio

Division of Ser. No. 193,355, May 12, 1988, Pat. No. 4,929,012. This application Jan. 19, 1990, Ser. No. 467,501

Int. Cl.[5] B66C *1/44*

U.S. Cl. 294—81.2 **9 Claims**



1. A loading apparatus suspended by a cable and having a plurality of chucks, each adapted for grasping a containerized spool, including strand material disposed thereon, transporting the spool to a position proximate a creel and orienting the spool for positioning on a creel spindle comprising, suspension link means adapted for attachment to the cable, support means suspended by said suspension link means, a plurality of block means mounted on said support means, each of said block means carrying one of the chucks, means for selectively moving at least some of said block means along said support means for varying the distance between the chucks, means mounting the chucks for rotation relative to said block means, and chuck rotation actuator means for effecting coordinated, equiangular rotation of the chucks.

5,024,478

BOX BLANK HOLDING DEVICE IN A BOX-MAKING MACHINE

Daigoro Toriyama, Chiba, Japan, assignor to Tanabe Machinery Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 309,346, Feb. 10, 1989, Pat. No. 4,930,830. This application Feb. 23, 1990, Ser. No. 485,082

The portion of the term of this patent subsequent to Jun. 5, 2007, has been disclaimed.

Int. Cl.[5] B66C *1/42*

U.S. Cl. 294—88 **8 Claims**

1. A box blank holding device for a box-making machine, comprising:

a main body;

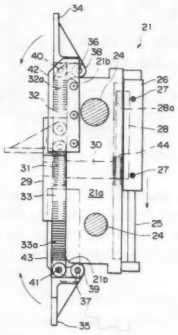
a driving rack;

motor means for reciprocally moving said driving rack relative to said main body;

a transmission shaft rotatably supported on said main body, said transmission shaft having a pair of pinions, one of said pinions being in meshing engagement with said driving rack;

a pair of holding-member actuating racks disposed in meshing engagement with the other said pinion;

each said holding-member actuating rack having a holding member pivotally mounted on an end thereof, whereby



said holding members are movable with said holding-member actuating racks, said holding-member actuating racks being moved by said motor means reciprocally moving said driving rack to turn said one of said pinions, thus turning said other of said pinions and moving said holding-member actuating racks; and

means for causing said holding members to move between a projecting position and a retracted position, said means comprising projecting and retracting guide grooves on said main body and rollers on said holding members for engagement with said guide grooves.

5,024,479

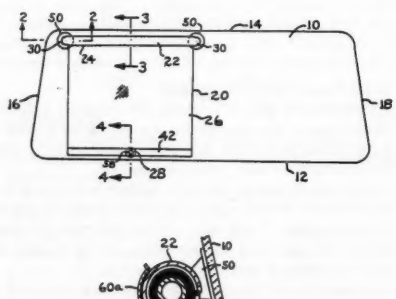
AUTOMOTIVE SUN SCREEN

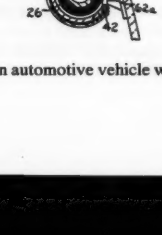
Gaylord D. Bryngelson, 811 E. School, Owatonna, Minn. 55060

Filed Nov. 16, 1989, Ser. No. 437,112

Int. Cl.[5] B60J *3/00*

U.S. Cl. 296—97.7 **2 Claims**





1. For use on an automotive vehicle windshield: a sun screen

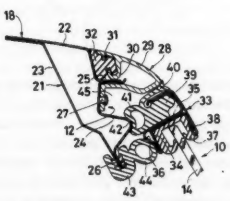
comprising an elongated hollow tube (22) having two ends and a longitudinal slot (24) extending between said tube ends; a suction cup attached to each end of the hollow tube for securement of the tube to an inner surface of the vehicle windshield; and elongated roller rotatably mounted within said tube; an opaque flexible sun-block sheet coiled around said roller for extension through the longitudinal slot, said sheet having a free edge (40); an anchor means (28) located on the windshield remote from said hollow tube; a stiffener strip (42) extending along the free edge of said flexible sheet; and a retainer means carried by said stiffener strip for engaging said anchor means to releasably retain the flexible sheet in an operating position extending along the windshield surface; said longitudinal slot (24) being located on the tube so that the slot faces the windshield, whereby the stiffener strip is at least partially concealed from persons seated within the vehicle when the flexible sheet is fully wound onto the roller within the hollow tube; said retainer means comprising a transversely curved handle structure extending partially around the hollow tube when the flexible sheet is fully wound onto the roller.

5,024,480

BODYWORK FOR AUTOMOBILES

Luigi Petrelli, Legnano, Italy, assignor to Alfa Lancia Industriale S.p.A., Arese, Italy

Continuation of Ser. No. 282,492, Dec. 12, 1988, abandoned. This application May 11, 1990, Ser. No. 522,066
Claims priority, application Italy, Dec. 24, 1987, 23222 A/87
Int. Cl.[5] B60J *10/08*
U.S. Cl. 296—146 **4 Claims**



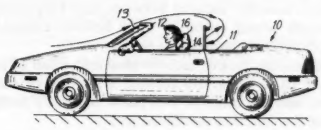
1. Bodywork for an automobile, the automobile having a plurality of doors, each door having a glass window panel, the bodywork comprising a longitudinal member, the longitudinal member having a plurality of steel plates which are welded together to form a box-type beam, one of said steel plates having a substantially horizontal upper flange extending towards the doors, each door having a rim, the rim of each door being sealable with the longitudinal member, the rim having a first crosspiece, the first crosspiece being a structure formed of at least one first section bar, the first section bar having a substantially "C"-shaped cross-section and extending downward to receive the glass window panel, a longitudinal chamber being positioned between the longitudinal member and the first crosspiece structure of each door, a supplemental section bar being positioned and shaped to partially seal the longitudinal chamber, a first sealing gasket for sealing the first crosspiece of each door with the longitudinal member, and a second sealing gasket for sealing the supplemental section bar with the longitudinal member, the supplemental section bar being secured to the longitudinal member, and the supplemental section bar having a wall with an arcuate cross-section and being curved to conform to outer outlines of the longitudinal member and the first crosspiece whereby aerodynamic resistance of the automobile is improved.

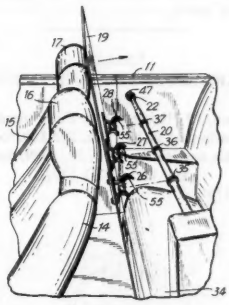
5,024,481

WIND BAFFLE ADJUSTABLE FOR DIFFERENT CAR WIDTHS

Robert S. Swersky, 72 Short Way, Roslyn, N.Y. 11577

Filed Sep. 24, 1990, Ser. No. 586,681
Int. Cl.[5] B62D *39/00*
U.S. Cl. 296—180.1 **22 Claims**





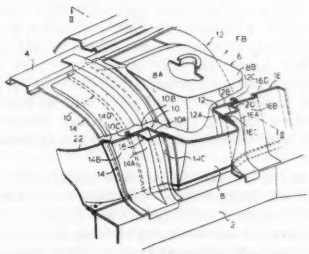
1. A wind baffle for convertible automobiles comprising:
a sheet of substantially rigid, transparent material;
a rod having ends attachable to respective inner side body surfaces of a convertible automobile;
said rod including means for adjusting the length thereof; and
means for affixing said sheet to said rod such that said sheet can be held in place behind the front seat compartment of said convertible automobile to prevent wind currents from passing from the rear of said convertible automobile to the front seat compartment.

5,024,482

FRONT BODY STRUCTURE OF AUTOMOTIVE VEHICLE

Hayatsugu Isukimi, Hiroshima, and Reiji Kikuchi, Yokohama, both of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Jun. 4, 1990, Ser. No. 531,405
Claims priority, application Japan, Jun. 2, 1989, 1-64815
Int. Cl.[5] B62D *27/00*
U.S. Cl. 296—194 **4 Claims**



1. A front body structure of a vehicle including a side frame and a front wheel reinforcement, both extending in a length-

wise direction from front to back of the vehicle, a front wheel housing connected between the side frame and front wheel reinforcement for receiving therein a front wheel, and a suspension tower for supporting a suspension, said front body structure comprising:

wheel aprons secured to and located on opposite sides of, in said lengthwise direction, said suspension tower, said wheel aprons extending in said lengthwise direction and forming said front wheel housing;

a junction member secured between said suspension tower and each wheel apron to form hollow channel frames adjacent to said suspension tower;

a pair of holding means, each divided into a pair of parts, one of said parts integrally formed with one of said wheel aprons and the other of said parts integrally formed with one of the junction members; and

a bracket for a front suspension arm rigidly held between each pair of parts.

5,024,483

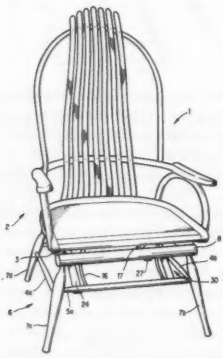
SWING ROCKER APPARATUS AND FURNITURE USING SAME

Zora R. Kamman, 19 Highland Dr., Peterborough, N.H. 03458

Continuation-in-part of Ser. No. 258,158, Oct. 14, 1988, abandoned. This application Nov. 20, 1989, Ser. No. 439,412

Int. Cl.[5] A47D *13/10*

U.S. Cl. 297—273 **10 Claims**



1. A swing rocker apparatus adapted for attachment to a furniture piece said furniture piece having a base assembly and an upper portion assembly whereby said base assembly is in fixed position relative to a surface upon which said base assembly rests and said upper portion assembly is movable relative to said base assembly said rocker apparatus comprising:

four base assembly low rotational friction attaching means adapted to be securely affixed to said base assembly;

two pairs of hanger members a front pair and a rear pair each pair held in spaced relationship by a front hanger stretcher and a rear hanger stretcher, each of the four upper ends of said hanger members rotationally attached to said four base assembly attaching means affixed to said base assembly, each hanger member of said two pairs of hanger members being configured so that when they are attached to said furniture piece said piece will be free of spaces defined by moving components which spaces are sufficiently large whereby injury to small body parts does not occur;

a right and a left side frame each comprising a first and second side frame member said right and left side frames held in spaced relationship by a side frame stretcher, each of four bottom inward facing surfaces of said pairs of first and second side members having affixed thereto a frame member low rotational friction attaching means each of said four frame member attaching means adapted to receive a bottom end of one of said four hanger members and each of said first and second side frame members having an attaching surface which surface is rigidly affixed to said upper portion assembly;

said two pairs of hanger members each have an arcuately configured portion with an inward directed radius of curvature and said arcuate portion of said hanger members being located inwardly of said four frame member attaching means by a predetermined distance; and

a front to back spacing of said top ends of said front and rear hangers being substantially the same as a front to back spacing of said bottom ends of said front and rear hangers.

5,024,484

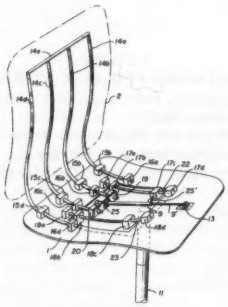
ADJUSTABLE SITTING DEVICE

Jurek Buchacz, "Lovli", N-2360 Ringsaker, Norway

Division of Ser. No. 474,311, Feb. 2, 1990, which is a continuation of Ser. No. 251,112, Sep. 29, 1988, abandoned, which is a continuation-in-part of Ser. No. 143,166, Jan. 1, 1988, abandoned. This application Aug. 15, 1990, Ser. No. 567,516

Int. Cl.[5] A47C *1/024*

U.S. Cl. 297—300 **6 Claims**



1. An adjustable sitting device having a seat, a backrest and means to alter the mutual angle between the seat and the back rest, said seat and/or back rest being turnable about an imaginary axis located above the seat and in front of the backrest wherein the back rest comprises frame members extending downward from the back rest and into a respective curved portion, the seat comprises at least a pair of runners attached to a seat frame, and a support means is located underneath said seat frame, said seat frame having an opening therein to provide access from above to said support means and said support means being interconnected from below to a chair subframe, said frame members slidably engaging a set of slide shoes located at the rear of the seat frame and said runners slidably engaging sets of slide shoes located on said support and extending through the opening, and control means extending between and being attached to a front region of at least one of said frame members and a front region of said seat frame to control and selectively, set the distance between said regions.

5,024,485

FRONT AND BACK ADJUSTABLE ROCKING SEAT SUPPORT ARRANGEMENT FOR SEAT HAVING RELATIVELY ADJUSTABLE SECTIONS

Joseph A. Berg, 5353 Topanga Canyon Blvd., Ste. 310, Woodland Hills, Calif. 91364, and Loren W. Eames, 3718 Penn Mar Dr., El Monte, Calif. 91732

Filed Jul. 5, 1990, Ser. No. 548,267

Int. Cl.[5] A47C *1/02;* **A61G** *15/00;* **B60N** *2/00*

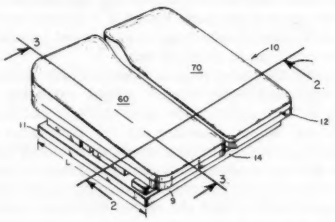
U.S. Cl. 297—312 **8 Claims**

1. A seat comprising:

a. a body further comprising,

(i) a base having an upper surface, a front, a rear and two longitudinal sides;
(ii) a pair of spaced apart resilient spacer members affixed transversely to the upper surface of said base and separated by a transverse gap which runs from one side of the base to the opposite side of the base;
(iii) two pairs of spaced apart resilient receiving means affixed to the upper surface of said base in said gap, each pair of resilient receiving means including a first resilient receiving means and a second resilient receiving means, with one of said first or second resilient receiving means positioned adjacent a side of the base and the other one of said first or second resilient receiving means positioned remote from the side;

b. a pair of longitudinally spaced apart seat cushion assemblies, each seat cushion assembly further comprising,
(i) a lower surface;
(ii) a seat rocking means attached to the lower surface, the seat rocking means configured to be resiliently and rotatably retained by one of the said pairs of resilient receiving means so that the seat cushion assembly can longitudinally rock back and forth with the intersection of the pair of resilient receiving means and engaged seat



rocking means serving as the pivot about which the seat cushion assembly rocks; and

c. a pair of spaced apart rocker adjustment means attached to said base and aligned with a respective one of the seat cushion assemblies such that the rocker adjustment means can be positioned to adjust the amount of rocking arc obtainable by the seat cushion assemblies, where each rocker adjustment means further comprises a generally rectangular shaped block which is hingeably attached to the base such that the rocker adjustment means can be aligned in a multiplicity of separate positions including a first position wherein one side of the rocker adjustment means lies against the upper surface of the base, a second position wherein the rocker adjustment means lies parallel to and in the same plane as the base, and a third position wherein the rocker adjustment means is supported generally perpendicular to the base by a rocker support means slidably affixed to the base;

d. whereby each seat cushion assembly can be independently rocked back and forth longitudinally and can be individually adjusted to the desired amount of rocking, and the rocking on the base is cushioned by the pair of spacer members.

5,024,486

ALL-PURPOSE ROCKING, SWIVELING, RECLINING, AND LIFTING CHAIR

Carl C. Auel, 14 Fifth Ave., Herminie, Pa. 15637

Filed Apr. 3, 1990, Ser. No. 504,114
Int. Cl.[5] A47C *1/02*
U.S. Cl. 297—330 **19 Claims**

1. A power operated, multi-position chair having a main frame, a seat attached in a pivotal manner to the mainframe, two armrests attached to the seat, a back attached at back pivots to the main frame, a footrest attached to the mainframe, and a switch to control the chair's positions comprising:

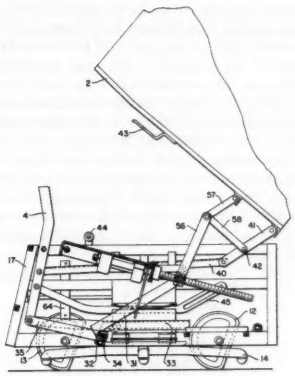
(a) a recline mechanical linkage that allows the chair to operate in a recline mode wherein it reclines the back, lifts the front of the seat, and lifts the footrest;

(b) a seat lift mechanical linkage that allows the chair to operate in a seat lift mode wherein it lifts the back of the seat;

(c) a guide roller mechanically linked to both the recline mechanical linkage and the seat lift mechanical linkage;

(d) a guide channel in which the guide roller operates to activate either the recline mechanical linkage or the seat lift mechanical linkage; and

(e) a power source with mechanical means to move the guide roller in the guide channel so that the chair can operate through its recline mode and seat lift mode; the power source with mechanical means comprising:



(f) a motor;

(g) a motor mount plate mounted in a pivotal manner on the main frame of the chair;

(h) a first power screw connected to the motor;

(i) a power cross bar with a first nut through which the power screw turns to move the power cross bar forward away from the motor as the screw turns counterclockwise (as viewed from the motor) and to pull the power cross bar toward the motor as the power screw turns clockwise (as viewed from the motor); and

(j) a lower power bar connected in a pivotal manner at its front end to the power cross bar and connected at its rear end to the guide roller.

5,024,487

METHOD OF CREATING AN UNDERGROUND BATCH RETORT COMPLEX

Henry J. Woestemeyer, Vista del Rio #2202, 200 Colorado Ave., Parachute, Colo. 81635, and Martha Oksuz, 1218 Carbide Court, Longmont, Colo. 80501

Filed Jan. 29, 1990, Ser. No. 471,426
Int. Cl.[5] E21B *41/10*; C10B *53/06*
U.S. Cl. 299—2 **1 Claim**

1. A method for creating an underground complex of sealed batch retorts, said sealed batch retorts to be utilized for the pyrolysis of processed oil shale ore therein, comprising the steps of:

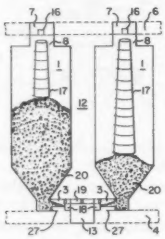
(a) establishing sites and levels underground for upper and lower main drifts, following the same course one above the other, to be centrally located across a land-holding in oil shale stratum that will be mined to become a complex of underground batch retorts, these main drifts to serve as access to and egress from the mine workings, and extending these drifts to the site of the first of a plurality of branch drifts that will intersect the main drifts at right angles and extend in both directions from the main drifts

to the boundaries of the planned complex of batch retorts, an upper branch drift to be centered in the lengthwise direction over a planned row of deep rectangular stopes that will extend to the level of a lower branch drift, and the lower branch drift centered in a wall that will divide the planned row of stopes from a second row of stopes to be established parallel to the first row of stopes centered along a second upper branch drift;

(b) extending said upper and lower branch drifts the length of the first of a plurality of rectangular stopes to be mined between the upper branch drift and the lower branch drift, and installing roof bolts in the roof of the upper branch drift to sustain the overburden;

(c) plotting the center of each lengthwise half of the planned rectangular stope at the bottom level, bearing in mind that the width of the rectangular stope will not be more than fifty feet, dividing the length of the planned stope by two, and excavating two ore chutes approximately ten foot square extending in a straight line above the floor of the lower branch drift to the center of the lower extremity of each half of the planned stope, then installing portable gates between the ore chutes and the lower branch drift;

(d) determining two centers of the rectangular stope in the upper branch drift, plotting as in (c), above, and creating by vertical crater retreat (VCR) stoping two centered ore passes, approximately ten feet square, from the centers established in the branch drift into the centered first ten square feet of the ore chutes that extend into the lower branch drift, then expanding the first ten square feet of the ore pass to the width of the branch drift, approximately



twenty square feet, disposing of the mined ore through the ore pass;

(e) excavating by conventional means the top of the planned rectangular stope, to create work space, beginning excavation below the floor of the upper branch drift, disposing of the mined ore through the ore passes, and installing roof bolts in the roof of the mined work space to sustain the overburden;

(f) creating the planned stope by the VCR stoping method, drilling from the mined work space created in (e), above, to create vertical walls approximately three-quarters of the distance from the top to the bottom of the stope, then gradually increasing the length of blasting holes in each half of the planned stope to shape a chute that is an inverted, truncated pyramid converging on the horizontal ore chute created in (c), above;

(g) loading the blasting holes with an explosive charge and blasting the drilled stope, in stages from bottom to top, to fragment the ore in the stope and remove it by fallout, and transporting the fragmented ore through the lower branch drift and the lower main drift to be crushed and screened in order to obtain particles of an optimum size for retorting, and, if desired, to be graded and batched according to assay;

(h) removing the portable gates from between the ore chutes and the lower branch drift, placing oil dropout pipes in the bottom of the emptied ore chutes, these oil dropout pipes to extend from the ore chutes through the lower branch drift and the lower main drift to a recovery system, shielding the portion of the oil dropout pipes within the ore chutes to protect them from the entry of shale ore when the stope is loaded for retorting, and installing a suction gas pipe centered between the ore chutes and extending into each half of the stope through the tops of the ore chutes, then sealing the bottom openings of the stopes at the lip of each of the ore chutes, sealing around the pipes which have been installed;

(i) loading the stope with crushed and screened shale ore through openings at the top of the stope, using portable, retractable loading pipes to effect loading in order to minimize free-fall and production of fines in the loading process, and loading shale ore to near the top of the entry into the stope, but leaving the shale bed at the top of each half of the stope rounded off, as it will fall from the loading device, to a depth of approximately ten feet in the center and around the outer peripheries of the stope to produce a cone-shaped shale bed in each half of the stope;

(j) inserting pipes that will bring compressed air from a surface source through the drifts into the upper portion of each half of the stope;

(k) sealing both openings into the stope at roof level, sealing around the compressed air pipes, at this point converting the stope to a batch retort wherein the temperature for pyrolysis can be controlled, and embedding in the seals observation hatches with an opening through which very hot air and exhaust gases, heated in a furnace by propane gas, or by other means, may be introduced into the top of the stope to ignite the shale bed;

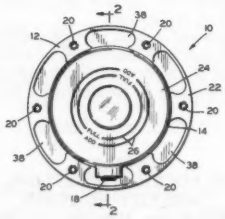
(l) repeating the above steps at subsequent retort sites, leaving separating walls between stopes, extending branch drifts to both sides of the main drifts to accommodate additional stopes extending to the boundaries of the planned complex of underground batch retorts, extending main drifts to accommodate additional branch drifts to the end of the planned complex, situating ore chutes that share a branch drift so that the chutes from each side of the shared drift are facing, and omitting the necessity to heat air and exhaust gases to ignite the shale bed, as succeeding batch retorts may be ignited by using the flammable gases remaining after shale oil has been removed in the recovery procedure from the first batch retort, and later from successive retorts.

5,024,488

HUB COVER ASSEMBLY

Thomas C. Lindhuber, Montgomery, Ala., and Edward N. Campbell, Oklahoma City, Okla., assignors to Dana Corporation, Toledo, Ohio

Filed Mar. 29, 1990, Ser. No. 501,686
Int. Cl.[5] B60B *7/00*
U.S. Cl. 301—108 S **7 Claims**



1. In a hub cover adapted for securement to a vehicular wheel end, said cover formed of a moldable material and including at least one cylindrical aperture defining an axis, and a threaded fastener comprising a shaft with threads having a defined root diameter, said fastener extending through said aperture for securement of said cover to said wheel end; an improvement comprising: said aperture comprising an integral flexible flange at one axial end of said aperture, said flange

integrally attached to the cylindrical wall of said aperture, said flange comprising spaced segments extending orthogonally to said axis, said segments defining a lead-in hole for said fastener, said segments defining a plurality of V-shaped spaces between adjoining segments, the thickness of each segment being tapered such that the greatest thickness of each segment is at its integral attachment to the aperture wall, and wherein said lead-in hole comprises an undeflected diameter substantially equal to the root diameter of said shaft; whereby upon insertion of said fastener, said segments are axially deflected to permit axial passage of said fastener through said aperture, whereby said lead-in hole enlarges to enable said threads of said fastener to pass into and through the aperture.

5,024,489

REGENERATIVE BRAKING SYSTEM FOR CAR

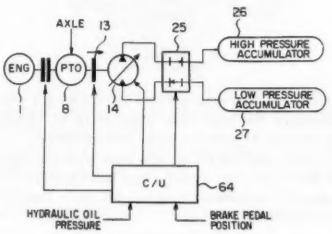
Koji Tanaka, and Takashi Shima, both of Tokyo, Japan, assignors to Isuzu Motors Limited, Tokyo, Japan

Filed Oct. 20, 1989, Ser. No. 424,554

Claims priority, application Japan, Oct. 27, 1988, 63-271526

Int. Cl.[5] B60T *13/74, 1/10*

U.S. Cl. 303—3 **12 Claims**



1. A regenerative braking system for a car having a brake pedal, a power take-off unit, and an engine, comprising:

a hydraulic oil circuit formed of:

a high pressure accumulator;

a pump/motor;

a circuit valve coupled to said pump/motor and said high pressure accumulator; and

a low pressure accumulator coupled to said circuit valve;

an electromagnetic clutch, coupled to said pump/motor, for connecting or disconnecting said pump/motor to or from the power take-off unit;

means for sensing the position of the brake pedal;

means for sensing the pressure of said hydraulic oil circuit;

control means for determining a braking torque corresponding to the sensed position of the brake pedal, and for determining a pumping capacity of said pump/motor from the determined braking torque and the sensed pressure of said hydraulic oil circuit, said control means decoupling the engine of the car, coupling said electromagnetic clutch, and closing said hydraulic oil circuit in which said pump/motor is controlled to obtain the determined pumping capacity in the braking mode of the car.

5,024,490

EMERGENCY COMPRESSED-AIR BRAKE FOR AUTOMOBILES

Tingyi Wang, Qingdao, China, assignor to Beijing Stone Group Co., Beijing, China

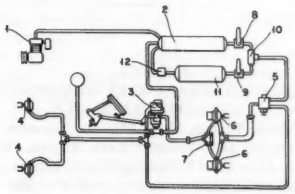
Filed Dec. 21, 1989, Ser. No. 454,694

Claims priority, application China, Dec. 27, 1988, 88216447.3

Int. Cl.[5] B60T *15/16*

U.S. Cl. 303—9 **2 Claims**

1. A compressed-air brake for automobiles, which comprises a combined braking air-chamber (**6**) comprising a front fork (**27**), an adjusting screw (**26**), a push bar (**13**), a front shell (**17**) of the air-chamber, a front cavity (**19**), a diaphragm (**20**), at least one helical spring (**21, 28**), a back shell (**22**) of the air-chamber, a back cavity (**24**), said front cavity (**19**) and back cavity (**24**) being separated by said diaphragm (**20**), said spring (**21, 28**) being mounted within said back shell (**22**), and having



one end bearing against a bottom of said back shell (**22**), and another end acting on said diaphragm (**20**) for applying a pulsed spring force during service braking to the wheels, in addition to a force produced by said compressed air.

5,024,491

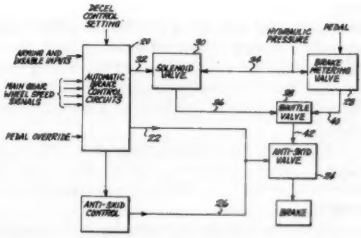
AUTOMATIC AIRCRAFT BRAKING SYSTEM INCLUDING WHEELSPEED RESPONSIVE CONTROL APPARATUS

George E. Pease, Jr., Renton; Ervin G. Romero, Seattle, and Rudi K. H. Glasenapp, Bellevue, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 743,047, Nov. 18, 1976, abandoned, which is a continuation of Ser. No. 432,911, Jan. 14, 1974, abandoned, which is a continuation of Ser. No. 200,092, Nov. 18, 1971, abandoned. This application Oct. 25, 1977, Ser. No. 845,311

Int. Cl.[5] B60T *8/78*

U.S. Cl. 303—93 **42 Claims**



1. In an automatic wheel brake control system for a plurality of aircraft wheels, the combination comprising:

automatic brake control circuit means for generating automatic brake control signals when the combined wheelspeed of at least two of said plurality of aircraft wheels exceeds a predetermined value;

antiskid control circuit means for generating antiskid control signals;

antiskid valve means responsive to said automatic brake control signals and said antiskid control signals for controlling brake pressure applied to at least one of said plurality of aircraft wheels;

a shuttle valve having first and second input ports and an output port;

solenoid valve means coupled to said automatic brake control circuit means and responsive thereto for transmitting main hydraulic system pressure to said first input port of said shuttle valve;

pedal control means for manually metering brake pressure to said second input port of said shuttle valve;

said shuttle valve shuttling either manually metered brake pressure or automatic system pressure through said shuttle valve output port to said antiskid valve means when the difference of said manually metered brake pressure and

said automatic system pressure exceeds a predetermined value.

5,024,492

HYDRAULIC BRAKING SYSTEM FOR AN AUTOMOTIVE VEHICLE

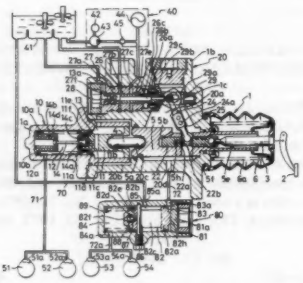
Michiharu Nishii, Toyota; Genji Mizuno, Toyoake; Yoshihisa Nomura, Toyota, and Masahiko Kato, Nagoya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of Japan

Filed Jul. 28, 1989, Ser. No. 386,250

Claims priority, application Japan, Jul. 30, 1988, 63-191475

Int. Cl.[5] B60T *13/12*

U.S. Cl. 303—114 **9 Claims**



1. A hydraulic braking system for an automotive vehicle comprising:

a power source for generating a hydraulic power pressure;

a reservoir for storing an amount of brake fluid;

a master cylinder for introducing said brake fluid thereinto from said reservoir and generating a hydraulic braking pressure in response to operation of a manually-operated member;

a hydraulic booster for actuating said master cylinder by said hydraulic power pressure supplied from said power source in response to operation of said manually-operated member;

a plurality of wheel brake cylinders for braking respective road wheels, said wheel brake cylinders being divided into a first group of wheel brake cylinders communicating with said master cylinder through a first hydraulic circuit and a second group of wheel brake cylinders communicating with said hydraulic booster through a second hydraulic circuit; and

an auxiliary cylinder disposed in said second hydraulic circuit, said auxiliary cylinder comprising a cylinder body having a cylinder bore defined therein and a piston axially slidably disposed within said cylinder bore, said piston dividing said cylinder bore into a first chamber communicating with said hydraulic booster and a second chamber communicating with said second group of wheel brake cylinders, and said piston blocking a fluid communication between said first chamber and said second chamber, wherein said piston of said auxiliary cylinder forms within said cylinder bore a third chamber communicating with said reservoir through a drain circuit, and wherein said piston is equipped with a valve mechanism for normally communicating with second chamber with said third chamber, and blocking the communication therebetween when a hydraulic pressure supplied from said hydraulic booster to said first chamber exceeds a hydraulic pressure in said second chamber.

5,024,493

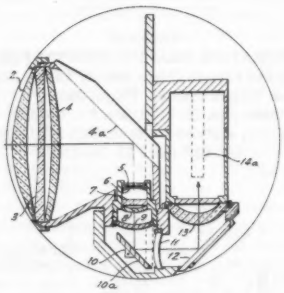
COMPACT INFRARED LENS ARRANGEMENT INCLUDING AT LEAST THREE REFLECTIONS

Louis R. Fantozzi, 4 Gordon Ave., Pelham, N.H. 03051; Lawrence Kessler, 173 8th St., Bethpage, N.Y. 11714, and Richard Draxler, West Babylon, N.Y., assignors to Louis R. Fantozzi, Pelham, N.H. and Lawrence Kessler, Bethpage, N.Y.

Division of Ser. No. 455,774, Dec. 28, 1989, Pat. No. 4,989,928. This application Aug. 17, 1990, Ser. No. 569,074

Int. Cl.[5] G02B *13/14*

U.S. Cl. 350—1.3 **4 Claims**



1. A refractive lens arrangement comprising a plurality of optical elements for receiving input infrared radiation and providing an optical path for said input radiation,

the effective focal length of said lens arrangement being at least about 240 mm, and the lens arrangement being fully contained in a spherical region no more than about 150 mm in diameter.

5,024,494

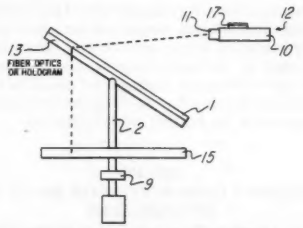
FOCUSSED LIGHT SOURCE POINTER FOR THREE DIMENSIONAL DISPLAY

Rodney D. Williams, Plano, and Felix Garcia, Round Rock, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 390,473, Aug. 3, 1989, which is a continuation of Ser. No. 231,638, Aug. 8, 1988, abandoned, which is a continuation of Ser. No. 105,924, Oct. 7, 1987, abandoned. This application Feb. 21, 1990, Ser. No. 482,471

Int. Cl.[5] G03H *1/02*

U.S. Cl. 350—3.6 **12 Claims**



1. A pointer for a three dimensional display system, comprising:

(a) a light source for generating a light beam,

(b) means to form an image from said light beam in a predetermined two dimensional space and transmit said image along a predetermined path having an axis passing through said space;

(c) rotating light receiving means having a rotating light receiving surface, the axis of rotation of said surface having a component continuously along said axis for receiv-

ing and displaying said image on said first surface, fixed points in said space impinging upon said surface displaying a substantially harmonic motion in a direction along said axis in response to said rotation of said surface; and

(d) a modulated focused light source movable relative to said axis of said rotating light receiving means.

5,024,495

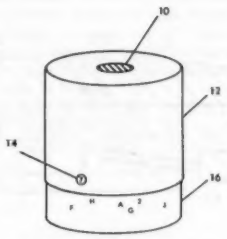
COMPUTER SOFTWARE PROTECTION, BY OPTICAL EFFECTS

David B. Anderson, 1600 Hartford St., Ann Arbor, Mich. 48103

Filed Apr. 20, 1990, Ser. No. 512,642

Int. Cl.[5] G02B *5/32*; G09C *1/04*

U.S. Cl. 350—3.7 **6 Claims**



1. An optical key, comprising:

a) an optical element to modify an image displayed by a computer display device.

b) a first enclosure means in the form of a cylinder that holds said optical element parallel to said computer display device.

c) an opening in said first enclosure means for viewing code data.

d) a printed means for storing said code data.

e) a second enclosure means in the form of a cylinder for holding said printed means.

f) a first alignment means for alignment of said second enclosure means in relation to said computer display device.

g) a second alignment means for alignment of said first enclosure means in relation to said second enclosure means and to said computer display device.

5,024,496

POLYGONAL MIRROR FOR SCANNING LIGHT BEAM

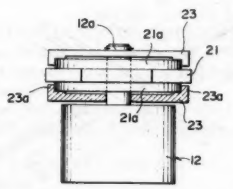
Tomohiro Oikawa, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 29, 1989, Ser. No. 459,310

Claims priority, application Japan, Dec. 29, 1988, 63-332471; Apr. 4, 1989, 1-85514

Int. Cl.[5] G02B *26/10*

U.S. Cl. 350—6.8 **9 Claims**



1. A polygonal mirror for scanning a light beam in an image exposure device, comprising:

a polygonal prism body rotatable about its own axis;

a plurality of reflecting flat mirror facets disposed on an outer circumference of said polygonal prism body, said mirror facets being movable along a circumferential path to deflect a light beam applied thereto;

said polygonal prism body having a plurality of angular corners each positioned between adjacent two of the mirror facets;

a first cylindrical member integrally formed with said polygonal prism body; and

a support on which said polygonal prism body is mounted, said support including an annular flange positionally limiting said polygonal prism body in a radial direction at positions near said angular corners.

5,024,497

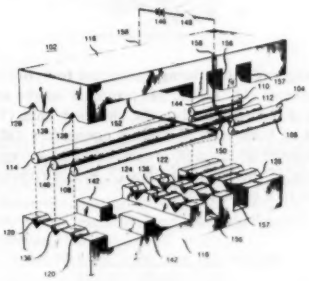
SHAPE MEMORY ALLOY OPTICAL FIBER SWITCH

Robert W. Jebens, Skillman, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 15, 1989, Ser. No. 311,567

Int. Cl.[5] G02B *6/36*

U.S. Cl. 350—96.2 **24 Claims**



1. An optical fiber switch comprising a switch housing having an internal first channel extending from an outside surface of the housing for receiving a first switchable fiber having a first end and a second channel extending from an outside surface of the housing for receiving a second fiber having a second end, the second channel including a first portion extending beyond the second end, the first end being movable into the first portion of the second channel and being in optical alignment with the second end when therein, the switch being characterized by

a first member made of a shape memory material having the property of restoration substantially to an original state when heated above a first temperature after being distorted while below a second temperature, this member being arranged in the housing to exert a force on the switchable fiber during shape restoration in a direction tending to push the first end into the first portion, the force exerted by the first member when heated above the first temperature being sufficient to push the first end into the first portion, and

means for heating and cooling the first member above and below the first and second temperatures, respectively.

5,024,498

SWITCH BOX FOR PRODUCING FREELY SELECTABLE OPTICAL PLUG CONNECTIONS

Johann A. Becker, Overath; Peter G. Deusser, and Olaf W. R. Holzmann, both of Cologne, all of Fed. Rep. of Germany, assignors to U.S. Philips Corp., New York, N.Y.

Filed Nov. 9, 1989, Ser. No. 434,644

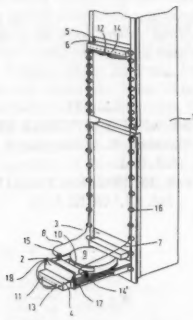
Claims priority, application Fed. Rep. of Germany, Nov. 12, 1988, 3838428

Int. Cl.[5] G02B *6/00, 6/26*; B65D *85/38*

U.S. Cl. 350—96.10 **13 Claims**

1. A switch box for producing freely selectable optical plug connections between LWG groups (27) of incoming optical

cables and LWG groups of outgoing optical cables by means of optical shunting lines (7, 8), wherein LWG groups (27) of the incoming optical cables are connected to a first group of adjacent termination units (2) and LWG groups of the outgoing optical cables are connected to a second group of adjacent terminating units (5), the individual LWGs of the incoming



and the outgoing cables being connected to optical plug connector elements (11, 12, 13, 14) provided on the termination units (2 and 5, respectively), the shunting lines (7, 8) being connected at both ends to mating connectors (20, 21), and wherein storage elements (9) are provided for storage of excessive lengths of the shunting lines (7, 8) not required for the production of a connection.

5,024,499

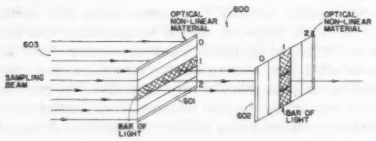
OPTICAL AND GATE FOR USE IN A CROSS-BAR ARITHMETIC/LOGIC UNIT

R. A. Falk, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 29, 1989, Ser. No. 414,475

Int. Cl.[5] G02B *6/12;* **H03K** *17/80;* **G06E** *1/04*

U.S. Cl. 350—96.11 **17 Claims**



1. An optical apparatus comprising:

a first and second plurality of light sources;

a first optical substrate having a first plurality of optical paths associated therewith, said first optical substrate being operable for transmitting an incident light beam through at least one of said first plurality of optical paths which is illuminated by at least one of said first plurality of light sources; and

a second optical substrate located adjacent to said first optical substrate and having a second plurality of optical paths associated therewith, said second optical substrate operable for transmitting a portion of said incident light beam, which has passed through said first optical substrate, through at least one of said second plurality of optical paths which is illuminated by said second plurality of light sources.

5,024,500

CANTILEVER BEAM RADIATION DEFLECTOR ASSEMBLY

Ian W. Stanley, Ipswich; John N. Shepherd, Birmingham, and Peter S. Dobson, Stourport, all of England, assignors to British Telecommunications public limited company, United Kingdom

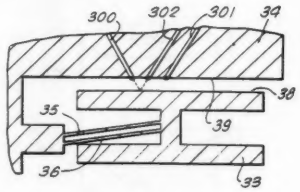
PCT No. PCT/GB88/00262, § 371 Date Dec. 2, 1988, § 102(e) Date Dec. 2, 1988, PCT Pub. No. WO88/07697, PCT Pub. Date Oct. 6, 1988

PCT Filed Mar. 31, 1988, Ser. No. 282,337

Claims priority, application United Kingdom, Apr. 2, 1987, 8707854

Int. Cl.[5] G02B *6/26*

U.S. Cl. 350—96.15 **17 Claims**



3. A radiation deflector assembly comprising:

at least three radiation waveguides;

a controllable radiation deflector positioned such that when the deflector is in a first position, radiation passes between one combination of two of the waveguides, and when the deflector is in a second position, radiation passes between another combination of two of the waveguides; and

control means responsive to control signals for controlling the position of the deflector

wherein the deflector comprises a cantilever beam having one end free and the other end integral with a supporting substrate on which are mounted waveguides and characterised in that the cantilever beam has its centre of mass closer to the free end of the beam than to the end hinged to the common substrate.

5,024,501

MANUFACTURING METHOD FOR POLARIZATION MAINTAINING OPTICAL FIBER COUPLERS

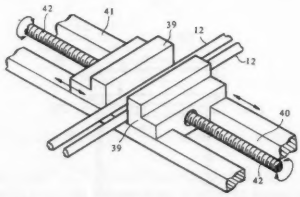
Hiroyuki Taya, Sakura; Mikio Yoshinuma, Yachiyo; Takeshi Yamada, Sakaura; Kenji Nishide, Kamakura; Fumio Suzuki, Sanbu; Hirohisa Fujimoto, Yokohama, and Ryozo Yamauchi, Sakura, all of Japan, assignors to Fujikura Ltd., Tokyo, Japan

Filed Apr. 9, 1990, Ser. No. 506,402

Claims priority, application Japan, Apr. 12, 1989, 1-92233

Int. Cl.[5] G02B *6/02, 6/16, 6/26;* **C03B** *37/06*

U.S. Cl. 350—96.15 **9 Claims**



1. A manufacturing method for a polarization maintaining optical fiber coupler comprising: a first step in which a portion of two polarization maintaining optical fibers are positioned so that stress applying parts of each are mutually aligned with respect to one another, and a second step in which a portion of said polarization maintaining optical fibers so aligned and held

tightly in the alignment are subjected to a fusing-elongation process, wherein said first step comprises using an image sensor, examining the light intensity distribution profile of an image obtained from the image sensor of light transmitted through said polarization maintaining optical fibers from a light source, and based on said examining, rotating said polarization maintaining optical fibers about longitudinal axes thereof to carry out said mutual alignment of said stress applying parts of said polarization maintaining optical fibers.

5,024,502

SYSTEM TO TRANSMIT OPTICAL INFORMATION AND COMPRISING A PLURALITY OF TRANSMITTERS AND RECEIVERS CONNECTED BY OPTICAL FIBERS

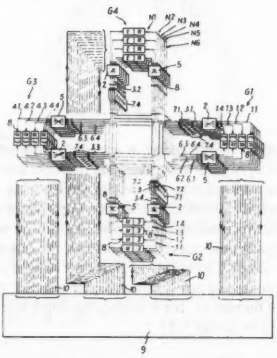
Jean-Michel Maisonneuve; Jean-Paul Domergue, both of Toulouse; Gabrielle Parize, Paris; Philippe Palandjian, Blagnac, and Jacques Isbert, Toulouse, all of France, assignors to Office National d'Etudes et de Recherche Aerospatiales (ONERA), Chatillon and Societe Nationale Industrielle et Aerospatiale, Paris, both of France

Filed Jun. 14, 1990, Ser. No. 538,152

Claims priority, application France, Jul. 10, 1989, 89 09242

Int. Cl.[5] G02B *6/28*; G02F *1/00, 2/00, 3/00*

U.S. Cl. 350—96.16 **9 Claims**



1. A transmission system for transmitting optical information, said system comprising a plurality of networks, each network comprising

a plurality of transmitters and receivers connected by optical fibers,

a first coupler interconnecting all of the optical fibers arriving at said receivers, and

a second coupler interconnecting all of the optical fibers leaving said transmitters,

said system also comprising a third coupler interconnecting all of the fibers leaving the transmitters in all of the networks.

5,024,503

HERMETIC GLAND FOR OPTICAL FIBRES

Duncan A. Gunn, Widdington, and Stephen J. McManus, Bishop's Stortford, both of Great Britain, assignors to STC PLC, London, England

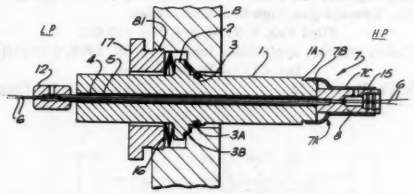
Filed Feb. 13, 1990, Ser. No. 479,119

Claims priority, application United Kingdom, Feb. 16, 1989, 8903560.4

Int. Cl.[5] G02B *6/36*

U.S. Cl. 350—96.20 **10 Claims**

1. An hermetic gland for optical fibres comprising a rigid gas-tight member having a passageway from a high pressure end of the gland extending therethrough to a low pressure end of the gland, at least one optical fibre extending into the passageway at the high pressure end and emerging from the passageway at the low pressure end, a gas-blocking grease jelly or similarly viscous liquid material filling said passageway over such length as to provide the required gas blocking property in the passageway of the gland, and a plug in the passageway at



the low pressure end whose purpose is to prevent leakage of said gas blocking material from the passageway and to provide the required hydraulic pressure-resisting property within said passageway of the gland.

5,024,504

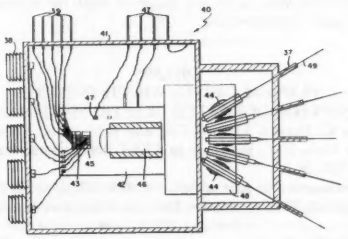
METHOD OF ALIGNING AND PACKAGING AN OPTOELECTRONIC COMPONENT WITH A SINGLE-MODE OPTICAL FIBER ARRAY

Robert A. Boudreau, Hampton, N.H., and William C. Rideout, Townsend, Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Nov. 20, 1989, Ser. No. 439,761

Int. Cl.[5] G02B *6/32*

U.S. Cl. 350—96.18 **39 Claims**



1. A method for the precise alignment of multiple uptapered single-mode optical fibers to a single packaged optoelectronic array device having at least two light-emitting sources, comprising the steps of:

selecting a graded index lens having a numerical aperture sufficiently large to optically access the light-emitting sources of said optoelectronic array for optically coupling each uptapered optical fiber to a respective light emitting source of said array through said lens;

securing said graded index lens on a substrate of said package a fixed distance from said optoelectronic array such that the light beams from said light-emitting sources are magnified and the spacing between said beams is expanded;

sequentially aligning said optical fibers with said light-emitting sources by optically coupling the thick end of each of said uptapered single-mode optical fiber to a respective light beam emanating from said optoelectronic array after said beam has been magnified by said lens; and

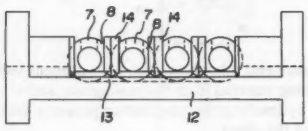
securing said optical fibers to said package after alignment.

5,024,505

ARRAY SPLICE FOR RIBBON-LIKE MULTI-CORE OPTICAL FIBERS

Junji Fujikawa, 1460-63, Onza Minamizakura, Yasu-cho, Yasu-gun, Sigaken, and Fumiaki Tamura, 220, Ogawa, Notogawa-cho, Kanzaki-gun, Siga-ken, both, Japan

Filed Feb. 5, 1990, Ser. No. 474,952
Claims priority, application Japan, Feb. 10, 1989, 1-15112[U]
Int. Cl.[5] G02B *6/26, 6/40*
U.S. Cl. 350—96.22 4 Claims



1. An array splice connector for ribbon-like multi-core optical fibers, comprising:

a plurality of capillary tubes of ultraviolet-transmitting glass, each having an inner diameter slightly larger than an outer diameter of a clad of an optical fiber, and including tapered portions on the opposite ends of said capillary tubes for guiding optical fiber bodies, and a groove formed in a middle upper surface region of each of said capillary tubes for discharging bubbles and adhesive agent therefrom;

a base including recesses formed in a middle upper surface region thereof for receiving and supporting lower portions of tube walls of said glass capillary tubes; and

a plurality of front-edged separators for guiding said optical fiber bodies into said capillary tubes, each respectively disposed at opposite ends of said receiving and supporting recess, said separators being disposed on said base with substantially the same pitch as that for said capillary tubes, wherein defined between adjacent separators are optical fiber insertion paths, each path having a width which increases with increasing distances from the opposite ends of each capillary tube.

5,024,506

PLENUM CABLES WHICH INCLUDE NON-HALOGENATED PLASTIC MATERIALS

Tommy G. Hardin, Lilburn, Ga., and Behrooz A. Khorramian, New York, N.Y., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 303,212, Jan. 27, 1989, abandoned. This application Dec. 21, 1989, Ser. No. 449,229
Int. Cl.[5] G02B *6/44*
U.S. Cl. 350—96.23 8 Claims

1. A communications cable, which comprises:

a core which comprises at least one communications transmission medium, said communications transmission medium being enclosed with a plastic material which is selected from the group consisting of a polyetherimide, a silicone-polyimide copolymer, and compositions which include a polyetherimide and a silicone-polyimide copolymer; and

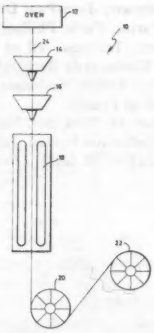
a jacket which encloses said core and which comprises a plastic material comprising a silicone-polyimide copolymer.

5,024,507

PHOTOPOLYMERIZABLE COMPOSITION FOR CLADDING OPTICAL FIBERS

Richard A. Minns, Arlington; Iris B. K. Bloom, Quincy, both of Mass., and Roopram Ramharack, Queens, N.Y., assignors to Polaroid Corporation, Cambridge, Mass.

Filed May 10, 1990, Ser. No. 521,671
Int. Cl.[5] G02B *1/04, 6/16*
U.S. Cl. 350—96.34 34 Claims



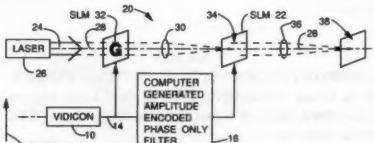
31. An optical fiber having a cladding comprising a solid solution of a copolymer of vinylidene fluoride and hexafluoropropylene, or a terpolymer of vinylidene fluoride, hexafluoropropylene and tetrafluoroethylene in a copolymer of an unsubstituted or fluorosubstituted diacrylate monomer with a fluorinated monofunctional acrylate monomer, the copolymer comprising from about 2 to about 12 parts by weight of the fluorinated monofunctional acrylate monomer per part by weight of the diacrylate monomer, the cladding having a refractive index of not more than about 1.43.

5,024,508

AMPLITUDE ENCODED PHASE-ONLY FILTERS FOR OPTICAL CORRELATORS

Joseph L. Horner, Cambridge, Mass., assignor to United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 4, 1989, Ser. No. 335,634
Int. Cl.[5] G02B *27/46;* G03H *1/16;* G06E *3/00*
U.S. Cl. 350—162.13 19 Claims



1. Method of modifying and utilizing a continuous phase-only filter, suitable for use in the Fourier Transform plane of an optical correlator, to enable said filter to be written on a pure amplitude responsive writing device comprising the step of:

adding a bias term K2 to a first filter function $H_{AP}(u,v)=K\text{-}\phi(u,v)$, said bias term having a value great enough to obtain a second amplitude encoded filter function $H_{AP}=K[k2+\phi(u,v)]$where all phase angles are positive real numbers or zero and K is a linear sealing factor.

5,024,509

STRUCTURAL COMBINATION OF PLASTIC LENSES

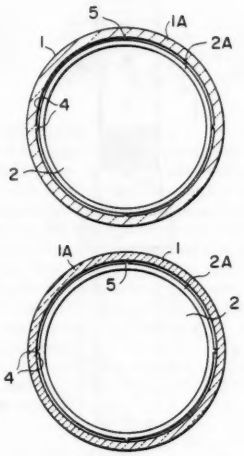
Etsuzou Kurihara, Hachioji, Japan, assignor to Konica Corporation, Tokyo, Japan

Filed Mar. 9, 1990, Ser. No. 491,230

Claims priority, application Japan, Mar. 14, 1989, 1-62681; Jan. 12, 1990, 2-5235

Int. Cl.[5] G02B *7/02, 3/00*

U.S. Cl. 350—254 **20 Claims**



16. A compound lens constructed from a pair of lenses, at least one of which is made of plastic, said compound lens comprising;

a first lens having a cylindrical collar around its circumference,

a second lens having a circular wall shaped to be inlaid inside said cylindrical collar with a clearance therebetween, and

at least three engaging members fixed to either the inner wall of said cylindrical collar or the outer wall of said circular wall, each of said engaging members having a surface for coming into contact with the wall to which they are not fixed and sized to be larger than said clearance so that said first and second lenses are engaged by interference fit between said surfaces of the engaging members and said wall to which they are not fixed.

5,024,510

CARTRIDGE HOLDER SYSTEM

Paula M. Lubins, 1199 Glendon, Maplewood, Minn. 55119, and John C. Mroszak, Box 306, Soudan, Minn. 55782

Filed Sep. 26, 1988, Ser. No. 248,581

Int. Cl.[5] G02B *27/00;* **G11B** *17/04*

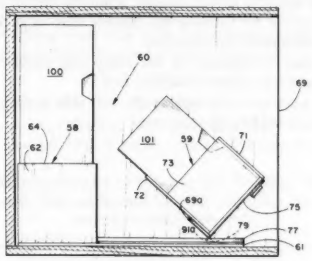
U.S. Cl. 350—321 **17 Claims**

1. A system for storing and selectively retrieving a recorded program on videocassette comprising:

an information disk for storing identification indicia on a recorded program;

an information disk viewer for viewing the information stored on said information disk; and

a storage rack for holding videocassettes or videocassette cartridges containing identification information, said storage rack including a first rear shelf for holding videocassettes or videocassette cartridges in a vertical position to expose the identification information on videocassettes or videocassette cartridges located on said rear shelf, a front compartment for holding videocassettes or videocassette cartridges in a vertical position for viewing the identification information on the cartridges, said front compartment having means for tipping said front compartment from a vertical position to a horizontal position to permit a user



to remove a videocassette located on said rear shelf without having to remove a videocassette or videocassette cartridge in said front compartment.

5,024,511

DISPLAY APPARATUS

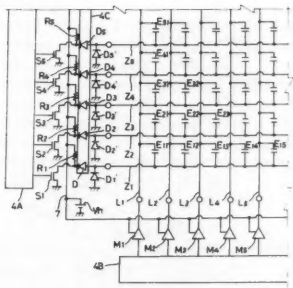
Ken Matsubara; Itaru Saito; Hirohisa Kitano; Kouichi Shingaki, and Tomohiko Masuda, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 25, 1989, Ser. No. 343,006

Claims priority, application Japan, Apr. 25, 1988, 63-102072

Int. Cl.[5] G02F *1/03, 1/01;* **G02B** *5/30*

U.S. Cl. 350—356 **20 Claims**



1. A display apparatus comprising:

a plurality of light transmitting windows arranged in a matrix on a solid-state modulator substrate having an electro-optical effect, said matrix including a plurality of rows and a plurality of columns;

a plurality of electrode pairs formed on one of an entry side surface and an exit side surface of said solid-state modulator substrate for forming electric fields across said light transmitting windows, respectively;

voltage application means for applying a voltage to each of said electrode pairs;

a plurality of scanning lines each electrically interconnecting first electrodes in the electrode pairs associated with the light transmitting windows arranged in one of said rows;

a plurality of signal lines each electrically interconnecting second electrodes in the electrode pairs associated with the light transmitting windows arranged in one of said columns;

a scanning circuit for sequentially and individually electrifying said scanning lines;

a signal circuit operable in response to a synchronizing signal received from said scanning circuit and display information for electrifying one of said signal lines connected to the electrode pair associated with a selected light transmitting window for forming an electric field;

an electric field control circuit for providing zero potential difference in the electrode pairs associated with the light transmitting windows except for said selected light transmitting window driven by said scanning circuit and said signal circuit for forming the electric field in accordance with said display information;

a first polarizer disposed on the entry side surface of said solid-state modulator substrate; and

a second polarizer disposed on the exit side surface of said solid-state modulator substrate.

5,024,512

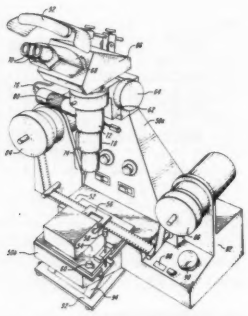
MICROFILM READER WITH MICROFILM AND RETICLE IMAGES PROVIDED TO EACH OF TWO BINOCULAR EYEPIECES

Arnold H. Greene, Newton, Mass., and Harold E. Holden, St. Johnsbury, Vt., assignors to American Photo Systems, Inc., St. Johnsbury, Vt.

Continuation of Ser. No. 888,114, Jul. 18, 1986, abandoned. This application Feb. 7, 1989, Ser. No. 309,007

Int. Cl.[5] G02B *21/20, 27/02, 27/34*

U.S. Cl. 350—514 **12 Claims**



1. A high resolution microfilm reader including an optical system having no more than 0.1% total distortion, comprising:

a supporting chassis;

a focusing mount adjustably attached to said chassis;

a binocular microscope head attached to said focusing mount and having first and second eye piece tubes and corresponding first and second ultrawide-angle eye pieces;

a beam splitter assembly attached to said focusing mount and having a beam splitter housing;

a variable magnification objective lens, attached to said beam splitter housing, for providing said beam splitter assembly with an image of a microfilm being viewed;

a reticle assembly, attached to said beam splitter housing and having a rotatable calibrated reticle for measuring features of said microfilm image being viewed, and means including at least one optical component for projecting an image of said reticle into said beam splitter assembly; and

said beam splitter assembly further including a beam splitter, for receiving said image of a microfilm being viewed and said reticle image, and for simultaneously providing both of said first and second eye pieces with said image of a microfilm being viewed and said reticle image.

5,024,513

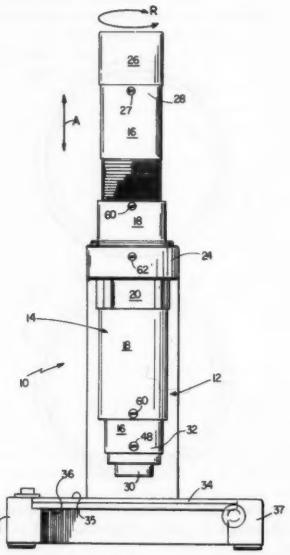
MICROSCOPE

George Hayashi, San Jose, Calif., assignor to Swift Instruments, Inc., Boston, Mass.

Filed Dec. 4, 1989, Ser. No. 444,962

Int. Cl.[5] G02B *7/02, 21/24*

U.S. Cl. 350—518 **8 Claims**



1. A microscope comprising:

a microscope stand defining a specimen stage for holding a specimen for viewing;

an elongated microscope tube mounted upon said microscope stand, said elongated microscope tube comprising a first focusing element and a third focusing element, and having an eyepiece lens at a first, upper end and an objective lens at a second, lower end, said objective lens disposed generally in position adjacent said specimen stage;

means for adjustment of position of said microscope tube axially along an axis of said microscope tube and relative to said microscope stand in a manner to vary the position of said objective lens relative to a specimen disposed upon said specimen stage;

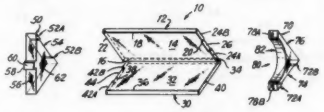
said means for adjustment comprising said first focusing element and a second focusing element mounted upon said microscope stand, said first focusing element co-axial with and mounted within said second focusing element and adapted for axial movement relative to said second focusing element upon application of axially directed force applied between said first focusing element and said second focusing element, said first focusing element and said second focusing element disposed in frictional engagement, and

said means for adjustment further comprising said third focusing element, said objective lens being fixedly mounted thereupon, said third focusing element co-axial with and mounted within said first focusing element and adapted for axial movement relative to said first focusing element upon application of rotational force applied between said third focusing element and said first focusing element, said third focusing element and said first focusing element disposed in threaded engagement.

5,024,514
LATERAL TRANSFER RETROREFLECTOR AND ROOF MIRROR FOR SAME

Zvi Bleier, Wantagh, and Morton S. Lipkins, Bayside, both of N.Y., assignors to Precision Lapping & Optical Co., Inc., Valley Stream, N.Y.

Filed Apr. 18, 1990, Ser. No. 511,711
Int. Cl.[5] G02B *5/08, 5/12, 7/18, 27/10*
U.S. Cl. 350—618 **39 Claims**

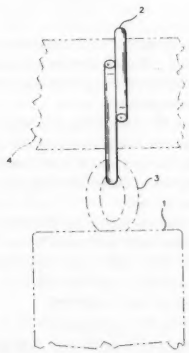


1. A hollow roof mirror comprising:
a first member having a first reflective planar surface, a first length defining edge, and a first edge surface;
a second member having a second reflective planar surface, a second length defining edge and a second edge surface;
said first member and said second member being positioned with respect to one another that said first length defining edge of said first member contacts said second planar surface of said second member;
a first support panel for engaging said first planar surface of said first member and said second edge surface of said second member; and
a second support panel for engaging said second planar surface of said second member and said first edge surface of said first member.

5,024,515
ORNAMENTS FOR EYE GLASSES

Steven D. Beckemeyer, and Lynn M. Beckemeyer, both of 335 Midridge, St. Louis, Mo. 63137

Filed Apr. 17, 1989, Ser. No. 339,512
Int. Cl.[5] G02C *11/02, 1/00*
U.S. Cl. 351—52 **1 Claim**

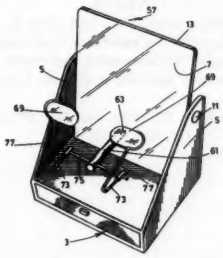


1. A spring metal fixture for readily attaching and removing a dangling ornament from the frames of eye glasses, in combination with eyeglasses wherein the improvement comprises:
(a), a decorative ornament having a support ring attached to the top for attaching the ornament to the eye glass frame;
(b), a single turn of spring metal wire wrapped around the eye glass frame with the ends over lapping on the inside portion of the eye glass frame;
(c), the ends of the spring wire formed inwards to press upon the eye glass frame;
(d), the spring wire conforming to the contour of the eye glass frame except on the bottom where is tapers to a rounded point;
(e), the ring having space between the inside circumference and the bottom of the eye glass frame to accommodate the ornament support ring; and,
(f), the spring wire ring with the ornament attached being slidably adjustable along the eye glass frame.

5,024,516
OPHTALMIC APPARATUS

Georges Zoueki, 4812 Verdun, Verdun, Quebec, Canada H4G 1N1

Continuation-in-part of Ser. No. 246,330, Sep. 19, 1988, abandoned. This application Jul. 12, 1989, Ser. No. 379,001
Int. Cl.[5] G02C *7/08, 1/00*
U.S. Cl. 351—57 **13 Claims**

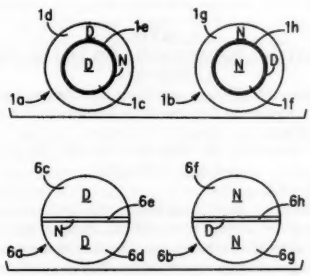


1. An apparatus for holding a pair of lenses in front of a mirror, comprising:
a support comprising a T-shaped member having a longitudinal arm and a cross arm, and a pair of spaced-apart lens carriers mounted onto said cross-arm;
a pair of opthalmic lenses mounted on said lens carriers to fit viewer's eyes and
means for mounting the longitudinal arm of the T-shaped member of the support onto the mirror in such a manner that the opthalmic lenses lie in a common plane in front of, and parallel to, said mirror.

5,024,517
MONOVISION CORNEAL CONTACT LENSES

Leonard Seidner, St. John's Pl., Brooklyn, N.Y. 11217

Filed Dec. 7, 1989, Ser. No. 447,201
Int. Cl.[5] G02C *7/04*
U.S. Cl. 351—161 **26 Claims**



1. A pair of corneal contact lenses, comprising:
a first contact lens for one eye of a patient, said lens having a first distant vision correction zone and a second distant vision correction zone separated from one another by a first auxiliary correction zone, said first distant correction

zone and said second distant vision correction zone having a first common focal length, said auxiliary correction zone having a first additional focal length different from said common focal length; and

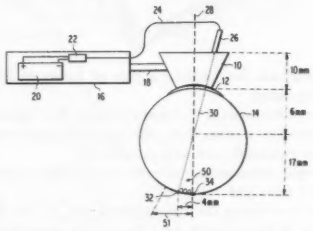
a second contact lens for the other eye of the patient, said second contact lens having a first near vision correction zone and a second near vision correction zone separated from one another by a second auxiliary correction zone, said first distant correction zone and said second distant vision correction zone having a second common focal length, said second auxiliary correction zone having a second additional focal length different from said second common focal length.

5,024,518

OPHTHALMIC CONTACT LENS WITH INTERNAL FIXATION LIGHT FOR EXAMINATION OF THE OPTIC NERVE

David W. Richards, Tampa, Fla., and Kent A. Murphy, Roanoke, Va., assignors to Center for Innovative Technology, Herndon; Virginia Commonwealth University, Richmond and Virginia Polytechnic Institute and State University, Blacksburg, all of Va.

Filed Mar. 22, 1990, Ser. No. 497,596
Int. Cl.[5] A61B *3/00*
U.S. Cl. 351—219 **8 Claims**



1. An instrument for examining the optic nerve in a patient's eye, comprising:

a contact lens for placement on the cornea of said patient's eye;

a source of light for providing a fixation target in said contact lens for said patient's eye;

a means for collimating and directing a narrow diameter beam of light from said source of light to a point in said patient's eye a fixed distance away from the optic nerve head of said patient's eye; and

a means for observing the optic nerve of said patient's eye.

5,024,519

APPARATUS AND METHOD FOR VISUAL-FIELD TESTING

Dwight L. Howard, Winters, and Chris A. Johnson, Davis, both of Calif., assignors to Regents of the University of California, Oakland, Calif.

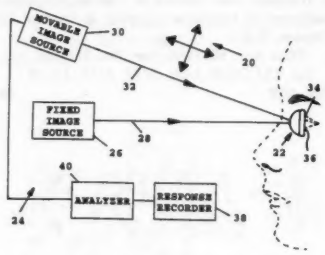
Filed Feb. 20, 1990, Ser. No. 482,278
Int. Cl.[5] A61B *3/02*
U.S. Cl. 351—226 **20 Claims**

1. Apparatus for measuring a subject's response to a light stimulus, over the subject's visual field, comprising:

an ocular device adapted to be placed over a subject's eye, including a transparent window defining an outwardly projecting, cavity-like inner surface dimensioned to encompass the subject's visual field in that eye,

an optical system for producing a fixed-position image at one position in the subject's visual field, and a series of transient light images at different selected positions in the subject's visual field, and

illuminating means for illuminating said surface to provide a substantially uniform glow on said inner surface, against



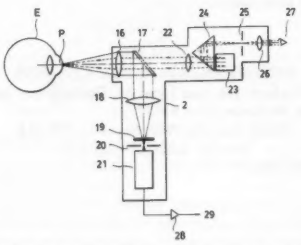
which said fixed-position image and transient images may be perceived.

5,024,520

OPHTHALMIC MEASUREMENT APPARATUS

Koichi Akiyama, Hino, Japan, assignor to Kowa Company Ltd., Japan

Filed Jan. 16, 1990, Ser. No. 464,903
Claims priority, application Japan, Jan. 23, 1989, 1-12015
Int. Cl.[5] A61B *3/10*
U.S. Cl. 351—221 **8 Claims**



1. An ophthalmic measurement apparatus in which a laser beam is projected at a selected spot in an eye under examination and laser light scattered therefrom is detected for ophthalmic measurement, comprising:

a laser light source for producing the laser beam;

a laser beam projector for projecting the laser beam at the selected spot in the eye under examination;

an optical slip projector for projecting a slit image onto the selected spot int he eye;

a light receiving section including photodetector means for detecting the laser light scattered from the eye;

a single-objective binocular type observation section for observing the selected spot in the eye where the laser beam and slit image are projected;

a mirror for splitting the optical path of the scattered laser light from the eye into a light path that directs light to the photodetector means and a light path that directs light to the observation section, wherein the mirror has a pair of apertures in the light path that directs light to the observation section and the ratio of the effective area of the mirror to the area of the apertures is about 1:1;

wherein the observation section includes a pair of lenses each configured to view substantially the same size area as each aperture; and

processing means for processing signals received from the photodetector means to perform the ophthalmic measurement.

5,024,521

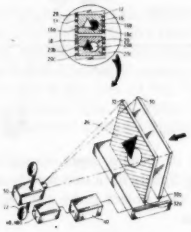
AUTOSTEREOSCOPIC PRESENTATION SYSTEM

Larry Zuchowski, 4706 Sepulveda #308, Sherman Oaks, Calif. 91403; Clyde I. Tichenor, 15524 Cohasset St., Van Nuys, Calif. 91406, and Irwin Ginsburgh, Newhall, Calif. 91321

Filed Nov. 19, 1990, Ser. No. 615,266

Int. Cl.[5] G03B *21/32*

U.S. Cl. 352—86 **26 Claims**



1. An autostereoscopic presentation system comprising:

(a) An enhanced film strip having a multiplicity of photographic frames with each frame having a two-dimensional optical image, with the optical image of the first frame having a foreground appearing as a conventional image and the background appearing as a matted image, and where the second frame has an optical image having the background appearing as a conventional image and the foreground as a matted image, and where successive frames alternate as described above,

(b) at least two stationary screens juxtaposed in planar separation from each other, where each said screen operates in either a translucent mode or a clear mode,

(c) a projector having means for projecting the enhanced film strip onto said screens, at a rate of at least 96 images per second,

(d) means for selecting and controlling the operational modes of said screens, where at any one time period, only one of said screens is in its translucent mode,

(e) means for synchronizing the operational modes of said screens with the respective alternating projections of the two-dimensional optical images where at any one time period, only one conventional image is projected onto the specific said screen that is operating in its translucent mode, where the conventional image is viewed on said translucent screen through said screens which are operating in their clear mode, or projected through a clear screen to a translucent screen, thus be alternately projecting the optical images onto said screens operating in their respective operational mode the viewer is able to perceive a three-dimensional volumetric image without the need for a viewing implement, where the perceived image is due to the persistence of vision that allows the eyes to retain the first projected image while the second image is being projected to thus cause a fusion of the two images which results in the perceived three-dimensional image.

5,024,522

RETICLE MASKING APPARATUS FOR A CAMERA AND METHOD

Stanislav Maron, 7801 N. 54th St., Paradise Valley, Ariz. 85253

Filed Jun. 21, 1990, Ser. No. 542,260

Int. Cl.[5] A63J *5/00*; G03B *23/02*

U.S. Cl. 352—89 **30 Claims**

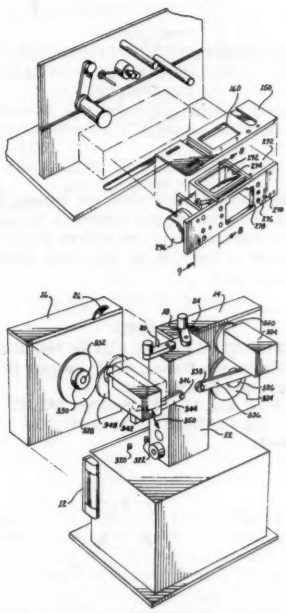
1. Apparatus for reticle masking a film strip in a camera, which camera includes a film transport mechanism disposed in a compartment having a rear wall and a bottom plate, said apparatus comprising in combination:

a) an aperture plate assembly for locating a film strip in predetermined registration;

b) mask retention means for retaining in registration with the film strip an image to be superimposed;

c) a sliding mirror mechanism having a first position for superimposing the image and a second position for exposing the film strip;

d) means for translating said sliding mirror mechanism from the first position to the second position and return; and



e) means for biasing said sliding mirror mechanism against both the rear wall and the bottom plate of the camera in each of the first and second positions and during transport of said sliding mirror mechanism between the first and second positions.

5,024,523

MAP PROJECTION SYSTEM

Hans G. Jerie, Enschede, Netherlands, assignor to Ambridge Limited, Hong Kong, Hong Kong

Continuation of Ser. No. 339,895, Apr. 18, 1989, abandoned, which is a continuation of Ser. No. 173,643, Mar. 25, 1988, abandoned, which is a continuation-in-part of Ser. No. 788,116, Oct. 16, 1985, abandoned. This application Oct. 19, 1989, Ser. No. 460,000

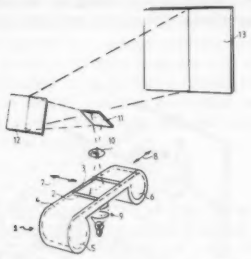
Claims priority, application Netherlands, Oct. 19, 1984, 8403193

Int. Cl.[5] G08G *1/137*; G03B *21/23, 21/28*

U.S. Cl. 353—11 **6 Claims**

6. A map display assembly comprising a microfiche representation of spatially separate first and second map transparency images of the same terrain and having different scales to be examined individually through an optical lens projection system at fixed magnification to reveal details of corresponding portions of the map transparency images permitted by the individual scales of the two map transparency images and the fixed magnification; a substantially rigid support for the microfiche having a rack along one side edge thereof; a receptacle defining a slot for receiving the support, a motor carried by the receptacle and a driving gear rotated by the motor and engageable with the rack to draw the support into the receptacle

along one path and to translate the support back and forth along the one path; and a housing having guide slots extending along a second path orthogonal to the one path and a second rack extending along the second path, the receptacle having



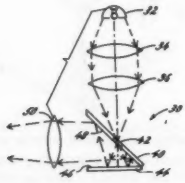
guides received in the guide slots, the housing including a second motor and a driving gear rotated by the second motor and engaeable with the second rack to draw the receptacle into the housing and to translate the receptacle back and forth along the second path.

5,024,524

REFLECTIVE IMAGE PLANE MODULE

Richard A. Flasck, San Ramon, Calif., assignor to RAF Electronics Corp., San Ramon, Calif.

Filed Aug. 11, 1989, Ser. No. 392,747
Int. Cl.[5] G03B *21/00*; G09G *3/36*
U.S. Cl. 353—31 **33 Claims**



1. A reflective image plane module, comprising:
reflective imaging means including a wafer based active matrix for forming a reflected light beam from light directed thereto and for imparting information onto said reflected light beam;
said wafer being a non light transmissive single crystal wafer substrate with said active matrix formed on one surface of said wafer; and
means for projecting said reflected light beam for viewing.

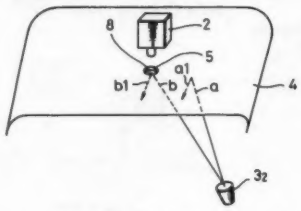
5,024,525

PHOTO SENSING DEVICE

Hajime Yoshida, Tokyo, Japan, assignor to Hajime Industries Ltd., Tokyo, Japan

Filed Feb. 9, 1990, Ser. No. 478,200
Claims priority, application Japan, Feb. 17, 1989, 1-37664
Int. Cl.[5] G03B *15/02*
U.S. Cl. 354—126 **7 Claims**

1. A photosensing device comprising:
a) means for photosensing the image of an object to be inspected;
b) a light diffuser reflection board located between said photosensing means and aid object and having a see-through-hole through which said photosensing means views said object;
c) a light source located between said light diffuser reflection board and said object and for indirectly irradiating said object; and
d) an insert member having a light reflectivity substantially the same as that of said light diffuser reflection board and



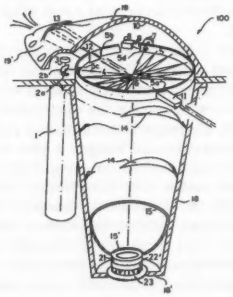
the property of passing light therethrough, said insert member being tightly fit in said see-through-hole to permit the image of said object to be photosensed through said insert member.

5,024,526

MEASURING INSTRUMENT FOR DETERMINING THE SCATTERING AND ABSORPTION COEFFICIENT OF THE ATMOSPHERE

Heribert von Redwitz, Starnberg, Fed. Rep. of Germany, assignor to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V., Cologne, Fed. Rep. of Germany

Filed Apr. 5, 1989, Ser. No. 333,392
Claims priority, application Fed. Rep. of Germany, Apr. 6, 1988, 3811475
Int. Cl.[5] G01N *21/47, 21/59, 1/02*
U.S. Cl. 356—73 **20 Claims**



1. A measuring instrument for determining the scattering and absorption coefficient of the atmosphere, comprising:
an emitter side comprising a light emitter having a light source which is a pulsed laser, and a device for varying the frequency associated with the laser;
an annular mirror (**5**) having an inlet slit (**5***a*) and a first diametrically opposed outlet slit (**5***b*) for the introduction and exiting of aerosol gas to be measured;
a receiver side having alight detector (**27**) and a sound detector (**22'**) for receiving emitter light attenuated in the atmosphere;
a rotationally symmetrical ellipsoidal mirror (**10**) disposed such that a first focal point (**6**) of the ellipsoidal mirror is located in a substantially center point of a substantially center plane of the annular mirror (**5**) and a second focal point is located in a substantially middle position of the light detector (**21**) and the sound detector (**22'**) associated with the light detector (**21**), and
wherein the light detector and the sound detector (**22'**) are accommodated in a fluidicly shaped space, so that radiation of small divergence emitted by the light emitter is

reflected a multiplicity of times, after introduction thereof into the annular mirror (**5**), ray segments of light reflected by the annular mirror interest concentrically about the first focal point (**6**) of the ellipsoidal mirror (**10**), and the attenuating gas to be measured are carried, via the first focal point (**6**) from the inlet (**5***a*) slit to the first outlet slit (**5***b*).

5,024,527

METHOD AND APPARATUS FOR REMOTE POSITION SENSING USING EDGE DIFFRACTION

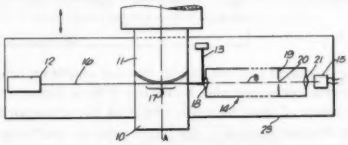
Andrew B. Harrison, Stevenage, United Kingdom, assignor to British Aerospace Public Limited Company, London, England

Continuation-in-part of Ser. No. 13,782, Feb. 12, 1987, abandoned. This application Mar. 31, 1989, Ser. No. 331,337

Claims priority, application United Kingdom, Feb. 12, 1986, 8603391

Int. Cl.[5] **G01B** *11/00*

U.S. Cl. 356—124 **56 Claims**



1. An apparatus for detecting the presence of a surface or interface at a predetermined position within a sensing region, comprising:

illuminating means for directing a collimated beam of optical radiation along a sensing axis through said sensing region;

optical radiation detector means, aligned with said sensing axis and located on the side of said sensing region opposite said illuminating means, for detecting optical radiation from said illuminating means which has been deviated by a surface or interface at said predetermined position; and

blocking means located between said sensing region and said optical radiation detector means for preventing optical radiation from reaching said optical radiation detector means when said beam is not deviated by said surface or interface so that the presence of said surface or interface at said predetermined position may be determined from the optical radiation detected by said optical radiation detector means.

5,024,528

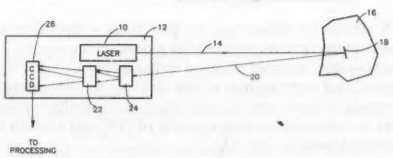
ALIGNMENT APPARATUS EMPLOYING A LASER LIGHT SCATTERER

Isaac Freund, Petach Tikva, and Michael Rosenbluh, Givat Shumel, both of Israel, assignors to Bar Ilan University, Israel, Israel

Filed Nov. 13, 1989, Ser. No. 435,019

Int. Cl.[5] **G01B** *9/02*

U.S. Cl. 356—356 **28 Claims**



1. Alignment apparatus comprising:

a source of coherent radiation mounted at a reference location and arranged to provide an output beam extending along a reference axis;

a laser light reflector mounted at a location sought to be aligned with respect to at least one of the reference location and the reference axis;

a laser light scatterer arranged to receive reflected laser light from the reflector and to produce a speckle pattern; and

a detector arranged to sense the speckle pattern produced by the laser light scatterer in response to incident reflected laser light, whereby variations in the speckle pattern indicate changes in relative orientation between the reference location and the laser light reflector.

5,024,529

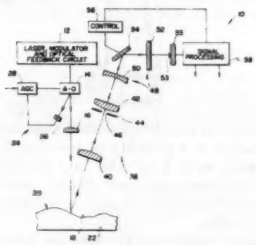
METHOD AND SYSTEM FOR HIGH-SPEED, HIGH-RESOLUTION, 3-D IMAGING OF AN OBJECT AT A VISION STATION

Donald J. Svetkoff, Ann Arbor, and Brian L. Doss, Ypsilanti, both of Mich., assignors to Synthetic Vision Systems, Inc., Ann Arbor, Mich.

Filed Jan. 29, 1988, Ser. No. 150,135

Int. Cl.[5] **G01B** *11/24*

U.S. Cl. 356—376 **21 Claims**



1. A method for the high-speed, high-resolution, 3-D imaging of an object at a vision station to develop dimensional information associated with the object, the method including the steps of: scanning a beam of controlled light in a scanning direction at the surface of the object at a first predetermined angle to generate a corresponding reflected light signal; receiving said reflected light signal at a second angle with a set of optical components for creating a relatively small focused spot of light from the reflected light signal, the set of optical components including first and second lenses; filtering the received light signal with the set of optical components; measuring the amount of radiant energy in the reflected light signal with a small area position detector having a detector area and having a position-sensing direction substantially orthogonal to the scanning direction and producing at least one electrical signal proportional to the measurement; and computing a centroid value for the reflected light signal from the at least one electrical signal; wherein the improvement comprises:

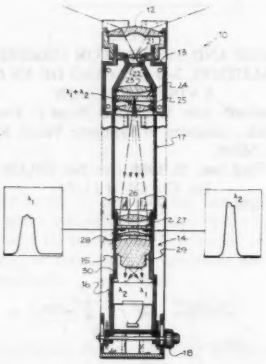
converting the focused spot of light into an enlarged, elongated spot of light and imaging the filtered light signal to the small area position detector with an anamorphic magnification and field lens system, including a third lens for magnifying the focused spot of light in the position-sensing direction of the position detector and a fourth lens having a relatively short focal length for reducing the focused spot of light in the scanning direction to form the elongated spot of light, wherein the position detector comprises a single detector element including the detector area of less than 20 mm^2 and having a relatively small capacitance and dark current and wherein the entire elongated spot of light is uniformly imaged to a discrete extended region of the detector area, to obtain a relatively high signal to noise ratio, the extended region being elongated in a scan dimension substantially orthogonal to the position-sensing direction, wherein spatial noise resulting from variations in sensitivity from point to point in the detector area are averaged.

5,024,530

MULTICHANNEL TELECENTRIC FILTERED IMAGER

Stephen B. Mende, Los Altos, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed Dec. 26, 1989, Ser. No. 457,079
Int. Cl.[5] G01J *3/46;* G01N *21/25;* G02B *27/12*
U.S. Cl. 356—402 16 Claims



1. An apparatus for enabling a distant object that emits rays of optical radiation in a plurality of wavelength bands to be separately imaged upon a detector in a plurality of distinct wavelengths simultaneously, each distinct wavelength being within a corresponding one of said wavelength bands, said apparatus comprising:

a) a lens system comprising an objective lens means, a telecentric lens means and a reimaging lens means, all disposed coaxially with respect to each other along an optic axis; said objective lens means causing rays of optical radiation emitted by said object to form an image at a focal region; said telecentric lens means being positioned between said objective lens means and said focal region to cause chief rays emerging from a central portion of an exit pupil of said objective lens means to be substantially parallel to said optic axis; said reimaging lens means relaying said image onto said detector;

b) filter means disposed adjacent said focal region where said chief rays are substantially parallel to said optic axis, said filter means passing rays of said optical radiation within said wavelength bands to said reimaging lens means, said filter means suppressing optical radiation in wavelengths outside said wavelength bands; and

c) wavelength-discriminating means disposed between said filter means and said detector for causing said image of said object formed at said focal region and relayed onto said detector to appear simultaneously as a plurality of distinct images on said detector, said distinct images being spatially separated from each other on corresponding portions of said detector, each of said distinct images being formed by rays of a corresponding one of said plurality of distinct wavelengths.

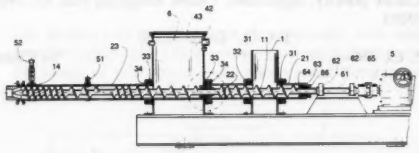
5,024,531

DEVICE FOR CONTINUOUS DEGASSING OF MIXES

Manfred O. Will, Wülfrath, Fed. Rep. of Germany, assignor to KWM-Kunststoffmaschinen GmbH, Wulfrath, Fed. Rep. of Germany

Filed May 18, 1989, Ser. No. 354,253
Claims priority, application Fed. Rep. of Germany, May 27, 1988, 3818003
Int. Cl.[5] B01F *7/02;* B29B *1/10*
U.S. Cl. 366—75 16 Claims

1. An apparatus for continuous degassing of a mix of liquid and solids, such as polymer binding agents and filler materials and/or fibers, said apparatus comprising an inlet housing, open to the atmosphere, a vacuum chamber adjustable to regulate the low pressure therein, and a unitary multi-zoned screw conveyor which provides a first conveying zone between said inlet housing and said vacuum chamber, wherein the mix is metered out of the area of the inlet housing and a vacuum seal is provided on the upstream side of said vacuum chamber by said mix residing in said inlet housing and in said first conveying zone; said screw conveyor also comprising a second conveying zone in said vacuum chamber for allowing said mix to remain in said vacuum section for a period of time sufficient for it to be degassed due to the low pressure in the vacuum chamber, said second zone also including means for conveying the



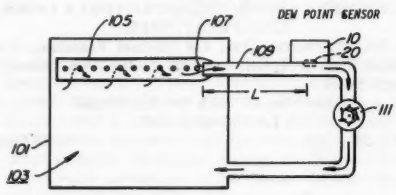
resulting degassed mix out of the vacuum chamber; said multi-zoned screw conveyor also including a third conveying zone down stream of said vacuum chamber for transporting the resulting degassed mix to a discharge port for discharge of the degassed mix into the atmosphere wherein a vacuum seal is provided on the down-stream side of said vacuum chamber by said mix residing in said third conveying zone; said inlet housing, multi-zoned screw conveyor, and said vacuum chamber being joined together to provide a hermetically sealed path of travel for said mix; and said multi-zone screw conveyor providing metering, compression, decompression, and compression zones, in sequence, which zones are formed by respective differences in pitch of flights, and/or by respective differences in diameter of the screw core.

5,024,532

DEW POINT MEASURING APPARATUS INSTALLATION SYSTEM

Dieter Rall, Newport Beach, Calif., assignor to Luxtron Corporation, Mountain View, Calif.

Filed May 22, 1989, Ser. No. 354,739
Int. Cl.[5] G01N *25/68*
U.S. Cl. 374—28 5 Claims



1. A system for measuring the dew point temperature of a gaseous atmosphere moving within a duct, comprising:

a sample flow channel of given inside dimensions having an open end terminating within said duct and extending outside thereof, said channel being substantially rectangular in cross-section with a height of "D" and a width that is much greater than D,

dew point temperature measuring apparatus including a pair of sensors positioned side-by-side in a top wall of said sample channel at a given distance "L" from said channel opened end,

means provided as part of said sample flow channel at a position therealong greater than L from said channel

opened end for moving a sample of the gaseous atmosphere from within the duct and through said sample channel past said dew point measuring apparatus with a uniform velocity,

means connected to said sample flow channel within said duct for causing gases passing thereby to be withdrawn therefrom substantially in a line across said duct, and

said given inside dimensions of the sample flow channel and said uniform gas velocity being such that the gas flow past said pair of sensors is characterized by a Reynolds number of substantially 1000, whereby said flow past said pair of sensors is assured to be substantially laminar.

5,024,533

RADIATION CLINICAL THERMOMETER

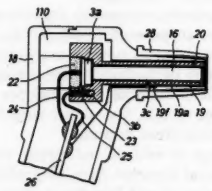
Shunji Egawa, Saitama, and Masato Yamada, Tokyo, both of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 335,616, Apr. 10, 1989, Pat. No. 4,932,789. This application May 10, 1990, Ser. No. 522,337

Claims priority, application Japan, Apr. 12, 1988, 63-88194; Mar. 17, 1989, 1-63552

Int. Cl.[5] **G01J** *5/10;* **G01K** *7/00, 1/20*

U.S. Cl. 374—126 **8 Claims**



1. A radiation clinical thermometer comprising:

a probe including an optical means having an optical guide for collecting infrared radiation from an object to be measured, an infrared sensor for converting infrared radiation energy collected through said optical guide into an electrical signal, a first temperature-sensitive sensor for measuring a first temperature of said infrared sensor and an ambient temperature thereof, and a second temperature-sensitive sensor for measuring a second temperature of said optical guide;

detection signal processing means for receiving electrical signals from said infrared sensor and said temperature-sensitive sensors and outputting the electrical signals as digital infrared data and digital temperature-sensitive data, respectively;

body temperature operating means for calculating body temperature data by correcting an electrical signal from said infrared signal dependent on the extent of thermal equilibrium between said infrared sensor and said optical guide measured on the basis of electrical signals from said first temperature-sensitive sensor and said second temperature-sensitive sensor; and

a display unit for displaying a body temperature in accordance with the body temperature data.

5,024,534

TEMPERATURE SENSOR FOR USE IN A SPARK PLUG OF AN INTERNAL COMBUSTION ENGINE

Yoshihiro Matsubara, and Shuzo Matsumura, both of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Jul. 12, 1989, Ser. No. 378,711

Claims priority, application Japan, Sep. 27, 1988, 63-241581; Sep. 29, 1988, 63-245761

Int. Cl.[5] **G01K** *1/14, 7/02;* **F02P** *17/00*

U.S. Cl. 374—144 **2 Claims**

1. A temperature sensor in which a thermocouple is embedded in a front end of a spark plug body, the front end of which is disposed in a combustion chamber of an internal combustion engine, and including an optical converter in which an output of the thermocouple is converter into an optical output signal when a temperature of the front end of the spark plug body exceeds a predetermined value,

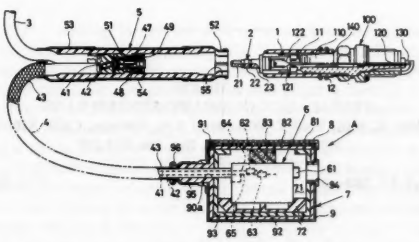
the temperature sensor comprising;

an inner insulator sleeve which is arranged to enclose a rear portion of the spark plug body;

tripolar coaxial plug or tripolar coaxial jack disposed to extend outside of a rear end of the inner insulator sleeve, and having outer, middle and inner shaft portion, the outer shaft portion being electrically connected to a center electrode of the spark plug body, while the middle and inner shaft portion being each connected to the thermocouple through lead wires;

an outer insulator sleeve covered by a metallic ring, the outer insulator sleeve being arranged to be detachably telescoped into the inner insulator sleeve, one end of the outer insulator sleeve being brought into engagement with a housing of the spark plug body when the outer insulator sleeve is telescope into the inner insulator sleeve;

the tripolar coaxial plug or tripolar coaxial jack being placed within the outer insulator sleeve to be electrically connected to the tripolar coaxial jack or the tripolar coaxial



plug when the outer insulator sleeve is telescoped into the inner insulator sleeve;

a high tension cord provided to be electrically connected to the tripolar coaxial plug or tripolar coaxial jack of the outer insulator sleeve so as to supply a high voltage with the center electrode; a shield cord electrically connected to the tripolar coaxial plug or tripolar coaxial jack of the outer insulator sleeve;

the shield cord and the high tension cord being introduced outside from an end opposite to that in which the outer insulator sleeve is telescoped into the inner insulator;

the shield cord having a pair of coated wires covered by a shield coat respectively, each one end of which is electrically connected to a corresponding terminal of the thermocouple through the tripolar coaxial plug or the tripolar coaxial jack, the other end of each coated wire being electrically connected to a corresponding input terminal of the optical converter in which a resistor is adapted to be energized to emit light beams when the output of the thermocouple reaches to a predetermined value; and

a shield coating portions of the shield cord being electrically connected at one end to the metallic ring of the outer insulator sleeve.

5,024,535

SEMICONDUCTOR LIGHT SOURCE TEMPERATURE MEASUREMENT

Charles R. Winston, Jr., North Canton, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 20, 1989, Ser. No. 453,538

Int. Cl.[5] **G01K** *01/14, 07/00*

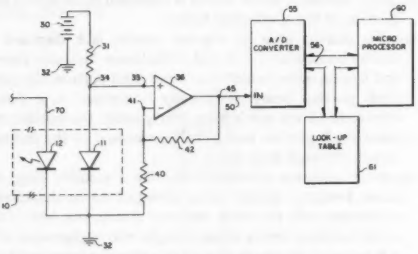
U.S. Cl. 374—178 **11 Claims**

1. Apparatus, comprising:

a semiconductor substrate;

a semiconductor light source, formed in said semiconductor substrate; and

temperature sensing means, formed in said semiconductor substrate in proximity to said semiconductor light source,



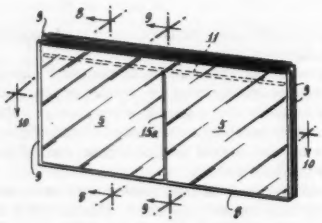
for providing an electrical signal indicative of an electrical voltage across said temperature sensing means, said electrical signal varying as a function of the temperature of said semiconductor substrate, whereby the temperature of said substrate varies as said light source is operated.

5,024,536

RESEALABLE COMPARTMENTED BAGS

Diane E. Hill, 8040 E. Woodwind Ave., Orange, Calif. 92669

Filed Jul. 16, 1990, Ser. No. 553,238
Int. Cl.[5] B65D *33/24, 30/22*
U.S. Cl. 383—38 **3 Claims**



1. A bag having a plurality of pockets, said bag including

at least four sheets of plastic sheet material of similar size and rectangular shape and overlying one another, said sheets being adhered to one another by a common seal line along the bottom edges thereof, and defining two front sheets and two back sheets,

said two front sheets being secured to one another by seal lines along their side edges and with a first resealable closure along their top edges, said two back sheets being secured to one another by seal lines along their side edges and with a second resealable closure along their top edges,

at least one first transverse seal line substantially parallel to said side edges of said two front sheets and running from said bottom edges thereof to said first resealable closure, said transverse seal line securing together said two front sheets, and

at least one second transverse seal line substantially parallel to said side edges of said two back sheets and running from said bottom edges thereof to said second resealable closure, said transverse seal line securing together said two back sheets,

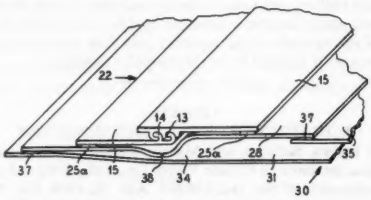
whereby a bag is provided having a multiplicity of separate pockets.

5,024,537

TAPE CARRIED PRE-CUT ZIPPER

Paul A. Tilman, New York, N.Y., assignor to Zip-Pak Incorporated, Northbrook, Ill.

Filed Jan. 8, 1990, Ser. No. 461,651
Int. Cl.[5] B65D *33/16, 33/34*
U.S. Cl. 383—63 **19 Claims**



18. A bag and reclosable zipper assembly, comprising:

a bag having opposite walls in a generally J-fold orientation with edges in offset relation and defining a mouth;

a carrier tape having opposite longitudinal edge portions, and means securing said opposite edge portions to respectively said offset wall edges;

straight substantially coextensive first and second extruded plastic zipper strips, each of which has a base flange of substantial width and with a respective zipper profile along one edge of the base flange complementary to the zipper profile of the other of said zipper strips;

said base flange of said first zipper strip extending in one lateral direction from its profile;

said base flange of said second zipper strip extending in opposite lateral direction from its profile and relative to said base flange of said first zipper strip;

said zipper profiles facing toward one another and being releasably interlocked;

said oppositely extending base flanges lying in a substantially parallel relation on said carrier tape;

means securing edges of said base flanges remote from said zipper profiles permanently to said carrier tape adjacent to said means securing said opposite edge portions of the carrier tape to said offset bag wall edges in such a manner that the assembly lies substantially flat; and

said carrier tape providing a rupturable sealing membrane in the span thereof between said zipper strip base sealing means.

5,024,538

PACKAGING BAG, ESPECIALLY FOR COOKED HAM, PROVIDED WITH DRAIN VALVE

Luigi Goglio, Via Solari 10, Milan, Italy

Filed Mar. 2, 1989, Ser. No. 318,077
Claims priority, application Italy, Mar. 10, 1988, 20831/88[U]
Int. Cl.[5] B65D *33/01*
U.S. Cl. 383—103 **5 Claims**

1. A packaging bag, in particular for cooked ham, characterized in that said bag (**1**) is made of thermoweldable material and is provided, in at least one of its walls (**4**), with a drainage hole (**6**), and is further provided, inside said bag, with a drainage valve secured to the wall of said bag, said drainage valve (**10**) comprising a disc of a plastic material, said disc having a center zone, and said disc further being provided with a plurality of radial, spaced ribs projecting from its surface (**11**) and

facing the adjacent internal surface of the wall of said bag, said wall preferably being secured to said ribs by thermowelding,

whereby the center zone (20) of said disc is arranged in front of said drainage hole.

5,024,539

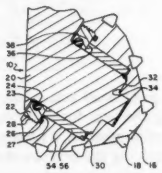
FRICTION BEARING AND CONE RETENTION THRUST SYSTEM FOR A ROCK BIT

Edward Vezirian, P.O. Box 215, Beaumont, Calif. 92223

Filed Aug. 13, 1990, Ser. No. 567,121

Int. Cl.[5] F16C *17/10*

U.S. Cl. 384—92 **5 Claims**



1. A friction bearing and cone retention thrust system for a rock bit comprising:

a cantilevered journal shaft depending from a structural body of a rotary cone rock bit, said journal shaft extending downwardly and radially inward from said structural body, said journal shaft forming an axially extending radial bearing surface and forming a radially extending primary thrust bearing surface adjacent a distal end of said journal shaft,

an annular ring about said journal shaft adjacent a fixed end of said journal shaft, said annular ring forming a gland housing a grease seal, said grease seal impinging said journal shaft, a distal side of said annular ring forming a radially extending secondary thrust bearing surface,

a secondary thrust member extending about said journal shaft, said secondary thrust member forming a radially extending thrust bearing surface adjacent said secondary thrust bearing surface of said annular ring, said secondary thrust member being axially located and secured to said journal shaft so as to trap said annular ring about said journal shaft,

a rock cutting cone, said rock cutting cone forming a bearing bore centrally entering base of said cone, said bearing bore extending to a radially extending primary thrust surface within said cone, said cone forming a counterbore about said enterance of said bearing bore,

means to rigidly secure said annular ring within said counterbore formed by said cone, said cone thus being axially located on said journal shaft between said primary and said secondary thrust surfaces.

5,024,540

SHAFT BEARING WITH A BALL SOCKET IN A FRAME-MOUNTED HOUSING

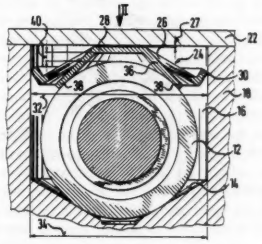
Friedrich Dreier, Lauf, and Ernst Fischer, Gernsbach, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 4, 1989, Ser. No. 389,599

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1988, 8809963[U]; Oct. 12, 1988, 3834691

Int. Cl.[5] F16C *25/04*

U.S. Cl. 384—203 **6 Claims**



1. In a bearing for a shaft with a ball socket mounted in a substantially cylindrical cavity in a frame-mounted housing, said shaft being guided through said ball socket, said ball socket resting in a bearing seat in said housing formed at a bottom of said cavity and pressed in said bearing seat by a structural member having a prestressed spring means providing a spring force, whereby said ball socket is movable in a radial direction against said spring force from said bearing seat, the improvement wherein said structural member has a dish-like base, whose diameter is larger than a diameter of said cavity and has a plurality of resilient tongues acting as said spring means supported by said base of said structural member and extending at least approximately in opposite directions, said tongues having free ends extending away from each other to rest on said ball socket under compression and other ends facing toward each other connected with said base.

5,024,541

MANUALLY OPERABLE SWEEPING-TYPE PRINTING APPARATUS

Shuya Tsukada, Tachikawa; Nobuyuki Mochinaga, Kunitachi, and Yasuo Kanoe, Tanashi, all of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 182,187, Apr. 15, 1988, abandoned. This application Jan. 30, 1990, Ser. No. 474,626

Claims priority, application Japan, Apr. 17, 1987, 63-57515[U]; Apr. 20, 1987, 63-58649[U]; Apr. 20, 1987, 63-58652[U]; May 7, 1987, 63-109701; May 8, 1987, 63-67931[U]; May 8, 1987, 63-67932[U]

Int. Cl.[5] B41J *3/36*

U.S. Cl. 400—88 **18 Claims**

1. A hand-held electronic printing apparatus, comprising:

housing means for containing components of the apparatus and for enabling the appartaus to be manually swept across a recording medium, said housing means including at least two cases arranged to be joined to one another;

a chassis including a single rigid base mounted in a mounting section of one of said cases of said housing means;

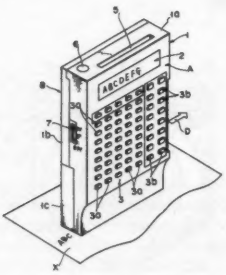
roller means fixed directly to said single rigid base for rotational movement and being adapted to protrude from said housing means to contact said recording medium, said roller means rotating when said housing means is swept across said recording medium;

an ink-ribbon detachably mounted directly to said single rigid base and being arrange to contract said recording medium;

ink-ribbon winding means fixed directly to said single rigid base for winding said ink-ribbon;

encoder means including an encoder disk fixed directly to said single rigid base, for generating a signal every time said housing means is swept over a predetermined distance with respect to said recording medium;

rotation-transmitting means fixed directly to said single rigid base, for transmitting rotation of said roller means to said ink-ribbon winding means and to said encoder disk; and



printing means provided in said housing means and for contacting said ink-ribbon, for transmitting ink of said ink-ribbon onto said recording medium;

wherein critical rotating components of the apparatus are fixed directly to said single rigid base for incorporation together within the housing means data storage means;

key input means mounted on said housing means for inputting data to said data storage means; and,

display means mounted on said housing means for displaying said data stored in said data storage means.

5,024,542

MAGNETIC ACTUATOR

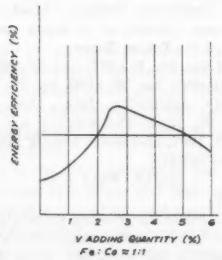
Minoru Tanaka, Nagano, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Filed Aug. 30, 1989, Ser. No. 400,596

Claims priority, application Japan, Aug. 30, 1988, 63-215640

Int. Cl.[5] B41J *1/60*

U.S. Cl. 400—124 **11 Claims**



1. A magnetic actuator for an impact print head, including a plurality of print wires selectively driven by the displacement of the actuator by magnetic attraction, comprising:

a core block having a ring-like protruded inner core within an interior portion of the core block formed of a soft magnetic material;

at least one coil disposed around the periphery of the inner core;

yoke means for being magnetically attracted to and moving towards the inner core when electric current flows through the coil;

the soft magnetic material including substantially equal amounts of iron and cobalt and from 2.4 to 2.8% vanadium.

5,024,543

IMPACT DOT PRINT HEAD

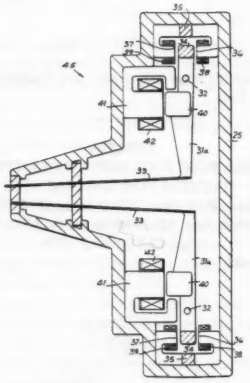
Akio Mitsuishi; Takashi Takeuchi, and Osamu Koshiishi, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed May 24, 1989, Ser. No. 356,822

Claims priority, application Japan, May 25, 1988, 63-129279; Jul. 18, 1988, 63-178578

Int. Cl.[5] B41J *2/27*

U.S. Cl. 400—124 **12 Claims**



1. An impact dot print head comprising an arm; means for pivotably supporting the arm for movement between a non-print position and a print position, a print wire mounted on the arm, first means for driving the arm towards the print position, said first means being a first magnet means and second means for driving the arm towards the non-print position and maintaining the arm in the non-print position without causing the arm to impact the remainder of the print head when returning to the non-print position, the second means being a second magnet means for holding the arm at the non-print position without mechanical contact by applying a magnetic force in the direction of wire movement towards the print position.

5,024,544

METHOD AND SYSTEM FOR CONTROLLING MECHANISM SECTIONS OF PRINTING APPARATUS

Mitsuhiro Taketani, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 212,377, Jun. 27, 1988, abandoned. This application Dec. 15, 1989, Ser. No. 449,151

Claims priority, application Japan, Jun. 30, 1987, 62-163057

Int. Cl.[5] B41J *29/02*

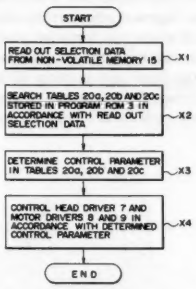
U.S. Cl. 400—692 **15 Claims**

1. A method for controlling operation of a print head, a carriage motor and a paper feed motor in a printing apparatus, the method comprising the steps of:

storing a plurality of control parameters for controlling the operation of the print head, carriage motor and paper feed motor;

non-volatilely storing selection data corresponding to the print head, carriage motor and paper feed motor for selecting predetermined control parameters of the stored control parameters;

reading out the stored control parameters in accordance with the non-volatilely stored selection data; and


START
READ OUT SELECTION DATA FROM NON-VOLATILE MEMORY 15
X1
SEARCH TABLES 20a, 20b AND 20c STORED IN PROGRAM ROM 3 IN ACCORDANCE WITH READ OUT SELECTION DATA
X2
DETERMINE CONTROL PARAMETER IN TABLES 20a, 20b AND 20c
X3
CONTROL HEAD DRIVER 7 AND MOTOR DRIVERS 8 AND 9 IN ACCORDANCE WITH DETERMINED CONTROL PARAMETER
X4
END

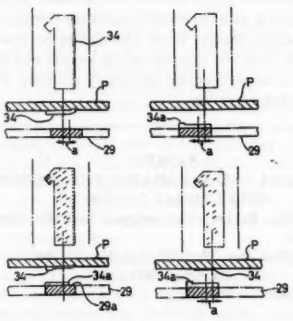
controlling the operation of at least one of the print head, carriage motor and paper feed motor in accordance with the readout control parameters.

5,024,545

MULTI-IMPACT CHARACTER ERASING APPARATUS WITH CONTROL OF CORRECTION RIBBON FEED

Satoshi Yoshimoto, Komaki, and Masaya Funamoto, Nagoya, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

Continuation of Ser. No. 173,544, Mar. 25, 1988, abandoned. This application Nov. 28, 1989, Ser. No. 442,307
Claims priority, application Japan, Mar. 28, 1987, 62-75200
Int. Cl.[5] B41J *29/373*
U.S. Cl. 400—696 **8 Claims**



1. A character erasable printing apparatus comprising:

inputting means for inputting data of characters and symbols and various command data,

printing means which comprises a type-wheel having a plurality of type elements of characters and symbols, a print ribbon fed from a supply spool of a ribbon cassette and a hammering mechanism provided with an asymmetrical hammering weight with respect to a hammering center coincident with a center of a type element to be hammered and which prints characters and symbols corresponding to inputted data,

a carriage which mounts said printing means and is driven in a first direction and in a second direction opposite to said first direction along a printing line by a carriage drive motor,

erasing means which comprises said type-wheel, a correction ribbon and said hammering mechanism which are mounted on said carriage, and which erases a printed character or symbol by hammering the same type element plural times onto said printed character or symbol through said correction ribbon in response to an operation of a correction command key installed on said inputting means, and said correction ribbon being installed to move relative to said printed character or symbol together with said carriage corresponding to movement of said carriage, and

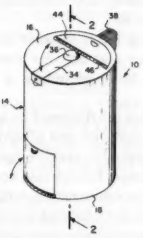
correction controlling means which, in erasing operation of said erasing means, controls said carriage to move to a first erasing position displaced by a predetermined minute distance from the printed position of said printed character or symbol in the first direction along said print line toward an over-inked edge portion of said printed character or symbol which is formed on an opposite side to a larger weight portion of said asymmetrical hammering weight with respect to said hammering center and then controls said erasing means to conduct a first erasing of said over-inked edge portion, and subsequently controls said carriage to move to a second erasing position in the second direction opposite to said first direction without feeding said correction ribbon relative to said carriage until a fresh portion of said correction ribbon facing said type element faces said over-inked edge portion and then controls said erasing means to conduct at least a second erasing of the over-inked edge portion.

5,024,546

COMPRESSIBLE THREE CHAMBER DEVICE FOR DISPENSING POMADE

Julio Guzman, P.O. Box 3495, Ridgewood, N.Y. 11385, and George Spector, 233 Broadway Rm. 3815, New York, N.Y. 10007

Filed Oct. 22, 1987, Ser. No. 111,293
Int. Cl.[5] A46B *11/00*; A47L *13/12*
U.S. Cl. 401—16 **1 Claim**



1. A device for dispensing pomade comprising a compressible container having a cover, a bottom and three chambers, wherein a first chamber is over the bottom storing a plurality of cotton balls, a compressible second chamber is under the cover for storing alcohol and a compressible third chamber extends from said cover to said bottom adjacent to said first and second chambers further comprising:

(a) a door hinged to said first chamber so that when said door is opened said cotton balls can be removed;

(b) a pivot spout mounted on said cover and fluidly connected to said second chamber said spout being pivotable to a raised open position communicating with said second chamber;

(c) a brush with a one way check valve fluidly connected to said third chamber so that when said third chamber is compressed pomade will exit to mix within said brush for application to said person's body;

(d) a second door hinged on said cover over said third chamber so that when said second door is opened said pomade can be filled therein; and

(e) said container having an annular track formed thereon in cooperation with said brush, making said brush rotatable, having means whereby said brush can be turned in one

instance to a position to be fluidly connected to said third chamber and in another instance to another position not to be fluidly connected to said third chamber.

5,024,547
WRITING UTENSIL WITH NOTEPAPER
Paul Y. H. Mui, and Rosa Y. M. Tso, both of 118 Tammy Cir., W. Pittsburg, Calif. 94565
Filed Dec. 21, 1989, Ser. No. 455,702
Int. Cl.[5] B43K *29/12, 29/00*
U.S. Cl. 401—195 **1 Claim**

1. An apparatus for holding notepaper on a writing utensil comprising:

a casing for retaining a writing means substantially centrally within said casing, said casing having a slot formed therein and a cap disposed at a first end of said casing;

a hollow cylindrical pin for carrying notepaper within said casing and wherein the writing means is receivable within said pin, said pin being in communication with said slot for dispensing notepaper from said pin through said casing;

a paper control lock for retaining the notepaper within said casing and restricting inadvertent movement of the notepaper, said paper control lock disposed adjacent an outer surface of said casing and including an extension extending into said slot; and

means for advancing the notepaper including:

a knob disposed on said cap for remotely dispensing the notepaper, said knob including a counterbore formed therein;

a second, noncircular pin disposed on an end of said cylindrical pin adjacent said first end of said casing, said counterbore being configured to receive said second pin such that rotation of said knob rotates said second pin; and

a toothed wheel for cooperating with said extension, said wheel including a bore formed therein for mating engagement with said second pin such that rotation of said second pin rotates said wheel, wherein movement of the teeth displaces said extension to thereby release said paper control lock and advance the notepaper.

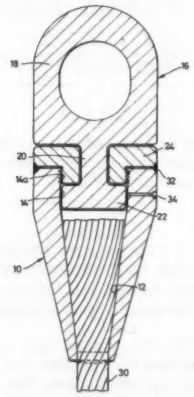
5,024,548
END FITTINGS FOR WIRE ROPE
David A. Timmington, Shatterford, United Kingdom, assignor to Griffin-Woodhouse Limited, United Kingdom
Filed Jun. 28, 1990, Ser. No. 545,402
Claims priority, application United Kingdom, Jan. 4, 1990, 9000128
Int. Cl.[5] F16D *1/12*
U.S. Cl. 403—78 **4 Claims**

1. A swivel end fitting for wire rope comprising:

(a) a terminal element having a distal end for linking the rope to an object in use and an integral shank shaped to provide a coaxial unitary stem and enlarged headed end;

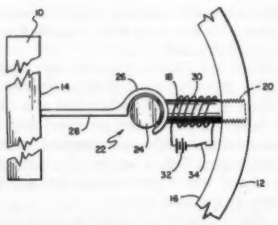
(b) a unitary socket element defining a longitudinal coaxial bore having a distal end portion to accommodate said headed end of said shank and a proximal end portion which converges in internal dimension away from said distal end portion for receiving an end of the rope to be operatively secured therein, said socket element having a distal end face proximate said distal end portion; and

(c) a retaining collar having a threaded portion for threaded engagement in said distal end portion of the bore and a flange portion disposed adjacent the distal end face of the socket element when said threaded portion is in threaded engagement in said bore, the outer diameters of the flange portion and the distal end portion of the socket element and the distal end of the terminal element being the same and flush with each other, to avoid snagging and being



exteriorly accessible on assembly of said collar and socket element, the collar being split longitudinally into separable parts to permit positioning thereof about the stem of the shank preparatory to said threaded engagement, whereby said threaded engagement retains the shank in swivelling relationship in said bore and couples the terminal element to the socket element while said flange portion remains accessible from the exterior of the swivel end fitting for tightening, inspection and secondary securing, if desired, of said retaining collar.

5,024,549
METHOD AND APPARATUS FOR JOINING STRUCTURAL MEMBERS
James F. Dalby, Reston, Va., assignor to MRJ Group, Inc., Oakton, Va.
Filed Jun. 28, 1989, Ser. No. 372,802
Int. Cl.[5] F16D *1/00*
U.S. Cl. 403—404 **5 Claims**



2. Apparatus for permanently joining structural components, comprising:

(a) a pair of disengageable, mechanically interlockable elements one of which is of elongated configuration and fabricated of a heat retractable material, each of said

elements being integral with or adapted for securement to a respective structural component to be joined; and

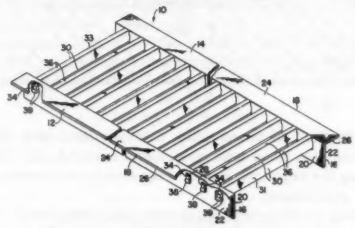
(b) means for heating said one element to a temperature sufficiently high to cause retraction thereof.

5,024,550

TRENCH GRATE

Jack Mainville, 25 Goffe St., North, Meriden, Conn.

Filed Sep. 26, 1989, Ser. No. 412,913
Int. Cl.[5] E01C *11/22*; E04C *2/42*
U.S. Cl. 404—4 **5 Claims**



1. In combination with a drainage structure of the type having an external supporting surface and inner side wall surfaces disposed inwardly and below said external supporting surface, a trench grate comprising:

a first and second elongated, angular frame member each having a downwardly extending leg and a supporting leg intersecting with and along the length of said downwardly extending leg and extending substantially perpendicular to said downwardly extending leg, said downwardly extending leg having an inner face surface and an oppositely disposed outer face surface, said supporting leg having a upwardly facing support surface face and a resting surface disposed opposite thereto;

each of said supporting legs being sized to engage with the external supporting surface of said drainage structure and to space each of said outer face surfaces of said downwardly extending legs from said adjacently disposed inner wall surface of said drainage structure;

each of said downwardly extending legs including a number of spaced apart, generally rectangularly shaped openings extending through said downwardly extending leg between said inner face surface and said outer face surface, said openings lying along a common axis extending longitudinally along said leg and substantially parallel to the intersection between said downwardly extending leg and said supporting leg;

a plurality of elongated cross members having a generally rectangular shape and an upper face and lower face disposed opposite thereto, said cross member having two L-shaped, tabbed end portions having the same general shape as said rectangularly shaped openings in said downwardly extending leg;

said cross members being located transversely between said first and second frame members and in a spaced, parallel relation to one another such that said cross members extend exclusively transversely across said trench grate, one of said L-shaped, tabbed end portions being received in one of said openings in said first frame member and the other of said L-shaped, tabbed end portions being received in one of said openings in said second frame member, said first and second frame members being arranged with the inner face surface of one facing the inner face surface of the other and said rectangularly shaped openings is one being in registry with the rectangularly shaped openings in the other, and

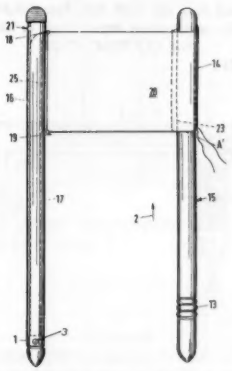
means for interconnecting said first and second frame members and said cross members to form an integral trench grate structure such that when the load capacity of the trench grate is exceeded, each of said supporting legs bends and causing each of said downwardly extending legs to contact said adjacently disposed inner walls of the said drainage structure to provide additional support for the excessive load being applied.

5,024,551

RESILIENT SLALOM GATE

Hans Hinterholzer, Post Box 118, N-1545 Hvitsten, Norway

Filed Dec. 20, 1989, Ser. No. 453,949
Int. Cl.[5] E01F *9/00*
U.S. Cl. 404—10 **15 Claims**



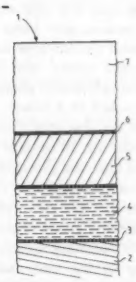
1. A slalom gate having a pair of parallel gate posts and a flag connected between the upper ends of said posts, the improvement comprising at least one hollow post and elastic cable means for connecting an edge of said flag to said hollow gate post, said cable extending down through said hollow post from said flag and being anchored near the lower end of said post.

5,024,552

METHOD OF OBTAINING A COMPOSITE SEALING STRUCTURE FOR PERMANENT ROADWAYS

Ghislaine Baillemont, Eaubonne, and Jean Beauverd, Lausanne/Suisse, both of France, assignors to Colas S.A., Paris, France

Filed Feb. 22, 1990, Ser. No. 482,951
Claims priority, application France, Feb. 23, 1989, 89 02366
Int. Cl.[5] E01C *3/00*
U.S. Cl. 404—31 **20 Claims**



1. A method of obtaining a composite sealing structure for permanent comprising applying a draining mix layer between an at least partially concrete base support layer and at least one sealed layer, said draining mix layer having a high content of voids which enable air and/or water being released as vapor

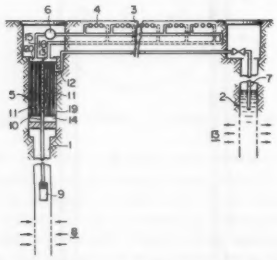
from the at least partially concrete base support layer to be diffused, so as to prevent appearance of deformities including bubbles and blisters in said at least one sealed layer.

5,024,553

NON-WATER-SPRINKLING TYPE SNOW MELTING METHOD AND SYSTEM

Kohei Katsuragi, Yamagata, Japan, assignor to Nihon Chikasui Kaihatsu Kabushiki Kaisha, Yamagata, Japan

Filed Jun. 19, 1989, Ser. No. 368,404
Claims priority, application Japan, Aug. 8, 1988, 63-197689
Int. Cl.[5] E01C *11/26*
U.S. Cl. 404—71 **13 Claims**



1. A system for melting snow lying on a structure overlying a ground surface by utilizing underground water warmed up by geothermy in a deep region in a first artesian well, comprising

pumping means disposed in said artesian well for pumping up the underground water;

a second artesian well disposed apart from said first artesian well;

heat radiating means, filled with an anti-freezing fluid, adjacent said structure and said ground surface; and

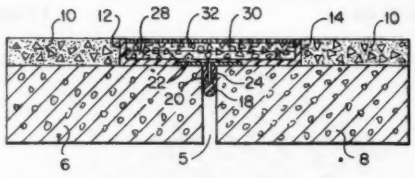
heat exchanging means disposed in said first artesian well, above said pumping means, for carrying out a heat exchanging operation by bringing the pumped up underground water in contact with the heat exchanging means and discharging said underground water to said second artesian well after the heat exchanging operation has been completed, said heat exchanging means comprising an outer casing, plurality of heat exchanger tube means disposed in said casing and extending vertically and parallelly and separated into first and second groups of heat exchanging tube means, said outer casing having in a lower portion thereof ejector pipe means for ejecting the pumped underground water into the casing and into contact with at least one of said groups of tube means, and header means disposed at a lower portion of said heat exchanging means so that lower ends of said heat exchanging tube means are all opened in the header means, an upper portion of said first group of the heat exchanging tube means being communicatively connected to said heat radiating means so that the anti-freezing fluid may flow upward through the first group of the heat exchanger tube means into the heat radiating means, an upper portion of said second group of the heat exchanging tube means being communicatively connected to said heat radiating means so that the anti-freezing fluid may flow downward from the heat radiating means into said upper portion, whereby anti-freezing fluid circulates through said groups of the heat exchanging tube means and said heat radiating means.

5,024,554

BRIDGE JOINT CONSTRUCTION

Douglas F. Benneyworth, East Sussex, England, and Richard J. Baker, Cincinnati, Ohio, assignors to Koch Materials Company, Wichita, Kans.

Filed Feb. 22, 1990, Ser. No. 483,575
Int. Cl.[5] E01C *11/02*
U.S. Cl. 404—74 **10 Claims**



1. A method of constructing a bridge joint in a channel which has been lined with elastomeric material, said channel overlying the expansion gap between structural members, said method comprising:

applying a mixture of aggregate and elastomeric binder material as a base layer of said mixture in the bottom of said lined channel;

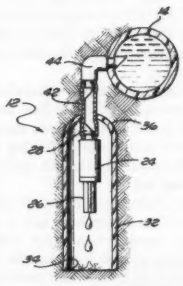
applying at least one or more succeeding layers of said mixture in the channel over said base layer to fill the channel to within ¾" of the top of said channel, the size of said aggregate in said base and succeeding layers being substantially uniform, the thickness of each layer being restricted to about the maximum size of said aggregate; and applying a top layer of said mixture to complete the filling of channel, the aggregate in said top layer being substantially smaller than the aggregate in the layers below said top layer.

5,024,555

SUB-SURFACE IRRIGATION SYSTEM

Richard D. York, 8062 Aster Ave., Yucca Valley, Calif. 92284

Filed Apr. 9, 1990, Ser. No. 506,086
Int. Cl.[5] E02B *13/00*
U.S. Cl. 405—48 **1 Claim**



1. For use in a sub-surface distribution system for irrigation having a conduit connected to a water supply, a plurality of fluid dispenser units connected to said conduit, each of said fluid dispenser units comprising:

a connector interconnected at one end to the interior of said conduit and the other end of said connector being coupled to a drip emitter being substantially recessed wholly in the interior of one end of an elongated hollow casing;

said elongated hollow casing having an enlarged opening at one and thereof and a reduced opening at the other end thereof adjacent which said drip emitter is positioned; and

tubing interconnecting the other end of said connector to said casing a portion of said drip emitter positioned in said tubing adjacent said casing reduced opening end, said casing enlarged opening communicating directly with growth, said casing acting as a protection for preventing said drip emitter from being clogged.

5,024,556

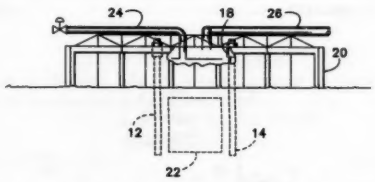
SYSTEM FOR ENHANCED DESTRUCTION OF HAZARDOUS WASTES BY IN SITU VITRIFICATION OF SOIL

Craig L. Timmerman, Richland, Wash., assignor to Battelle Memorial Institute, Richland, Wash.

Continuation-in-part of Ser. No. 255,057, Oct. 7, 1988, Pat. No. 4,956,535, which is a continuation-in-part of Ser. No. 60,253, Jun. 8, 1987, abandoned. This application Dec. 5, 1989, Ser. No. 446,384

Int. Cl.[5] F02D *3/00*

U.S. Cl. 405—128 **12 Claims**



1. A method for in situ vitrification of soil (**28**) containing organic waste material, comprising the steps of:

inserting two or more electrodes (**10, 12, 14, 16**), having surface compositions adapted for adherence with liquefied soil materials, into the soil at spaced apart locations so as to span at least a portion of said waste material;

passing an electrical current through said soil and waste material along an electrically conductive resistance path (**38**) between said electrodes by applying a voltage across said electrodes in order to heat and liquefy said soil and waste material between and adjacent said electrodes;

pyrolyzing volatile contaminants within said waste material by increasing their residence time within the heated area between and adjacent said electrodes by forming and maintaining a cold cap structure (**46**) of resolidified soil and waste material (**50**) over said liquefied soil and waste material (**40**) during continued passage of current between said electrodes; and

terminating the application of voltage to the electrodes in order to discontinue the flow of said current and permit cooling and solidification of the melted soil and waste material into a densified mass.

5,024,557

METHOD AND APPARATUS FOR CONSTRUCTING AN OFFSHORE HOLLOW COLUMN

Martin E. Iorns, 1512 Lakewood Dr., West Sacramento, Calif. 95691

Filed Sep. 22, 1987, Ser. No. 99,406

Int. Cl.[5] E02D *23/00*

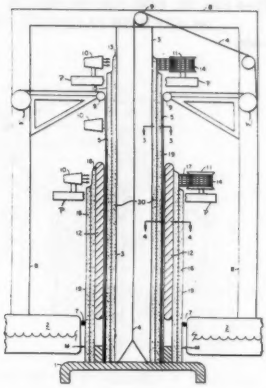
U.S. Cl. 405—223 **11 Claims**

1. An apparatus for slipforming tubing offshore comprising in combination:

means to support tubing extending from a single slipform,

means for alternatively applying cementitious material and reinforcing on one side of the single said slipform to form said tubing,

means to lower said tubing formed from said cementitious material and reinforcing into water,



and means to protect uncured cementitious material from washing away in water.

5,024,558

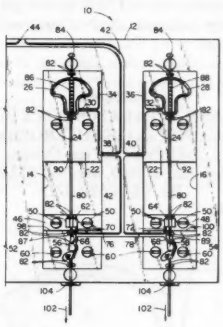
APPARATUS FOR MAKING INFLATOR PARTS

Glenn H. Mackal, 4923 59th Ave. S., St. Petersburg, Fla. 33715

Filed May 14, 1990, Ser. No. 523,102

Int. Cl.[5] B29C *39/10, 45/14*

U.S. Cl. 425—121 **8 Claims**



1. A mold, comprising:

a base member of predetermined configuration and dimension;

a mating cover for said base member;

a channel formed in said base member;

a first slidable block member disposed within said channel and slidable lengthwise thereof;

a second block member disposed in said channel;

an article-defining groove formed in said block member;

an article-defining cavity formed in said second block member;

said blocks defining means for receiving a strand disposed between said article-defining groove and said cavity; and

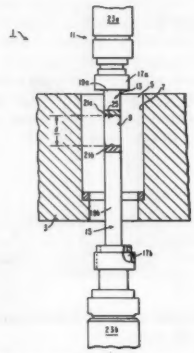
means for delivering flowable plastic to said article-defining groove in said slidably mounted first block member at any preselected position of said first block member in said elongate channel.

5,024,559

PUNCH FOR USE IN A PELLET PRESS

Peter H. Beuchel, Columbia, S.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 28, 1990, Ser. No. 486,231
Int. Cl.[5] B30B *11/02*
U.S. Cl. 425—406 4 Claims



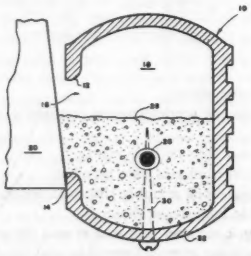
1. An apparatus for producing substantially uniform cylindrical uranium dioxide pellets with frusto-conical beveled ends useful for forming nuclear reactor fuel, said apparatus comprising a pair of reciprocating punch means for compressing and shaping granular uranium dioxide into said frusto-conical beveled end cylindrical pellets, each said punch means including a substantially flat face with a chamfered circumferential edge, wherein said face and said chamfered edge are formed from a substantially chip resistance alloy consisting essentially of substantially pure tungsten carbide having a grain size of less than one micron and 16.5 to 17.5% by weight cobalt and said substantially chip resistant alloy is substantially devoid of impurity interfaces.

5,024,560

METHOD AND APPARATUS FOR PROTECTION AGAINST COASTAL EROSION

Joseph W. Reilly, 2552 Prancer, New Orleans, La. 70131

Filed Jun. 4, 1990, Ser. No. 532,855
Int. Cl.[5] E02B *3/12*
U.S. Cl. 405—303 5 Claims



1. A method of forming a protection barrier member, comprising the following steps:

providing a vehicle tire casing having a central opening therethrough, a generally U-shaped interior chamber and a lower and upper beads facing the central opening;

providing a conical insert member having a wider base, a narrower top and an inclined continuous wall extending between the base and the top;

positioning the insert on a horizontal surface, so that the base rests on the horizontal surface;

placing the tire casing over the insert, such that the lower bead of the rim frictionally engages the wall of the insert;

forming a space between the inclined wall of the insert and the upper bead;

depositing a concrete mixture on the inclined wall of the insert and allowing the mixture to flow downwardly, under gravity, into the interior chamber formed by the tire casing;

at least partially filling the chamber with concrete;

allowing the concrete to harden within the tire casing; and

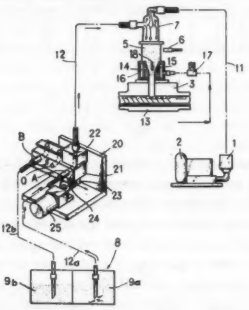
removing the tire casing from its engagement with the insert.

5,024,561

BULK MATERIAL FEEDER PROVIDED WITH INTERNAL CLEANING MECHANISM

Isao Kitagawa, 110-4, Kamiwada-machi, Takasaki-shi, Gunma-ken, Japan

Filed May 25, 1989, Ser. No. 356,693
Claims priority, application Japan, Oct. 4, 1988, 63-129606[U]
Int. Cl.[5] B65G *53/60*
U.S. Cl. 406—173 3 Claims



1. A bulk material feeder provided with an internal cleaning mechanism, comprising:

means for jetting out pressurized air for cleaning toward an inside of a vessel to supply molding materials to a molding machine,

at least one nozzle provided to form an air current from the pressurized air in the vessel, and

baffles installed so as to exert an influence upon the air current formed by the at least one nozzle inside the vessel, the baffles being movable so as to appear by moving outside and disappear by moving inside the vessel as required.

5,024,562

PRESSURE FOOT FOR PRINTED CIRCUIT BOARD DRILLING MACHINE

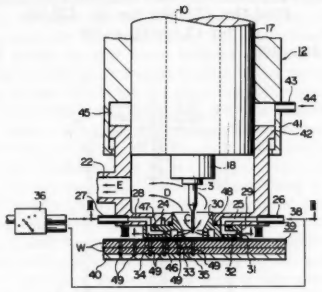
Kunio Arai, Atsugi; Yasuhiko Kanaya, Machida; both of Japan, assignors to Hitachi Seiko Ltd., Japan

Filed Nov. 30, 1990, Ser. No. 619,991
Int. Cl.[5] B23B *47/00*
U.S. Cl. 408—1 R 15 Claims

1. A pressure foot for a machine for drilling a printed circuit board, said pressure foot being supported to be slidable in an axial direction of a rotor shaft, connected to a vacuum suction source and adapted to depress the printed circuit board during a drilling comprising

a first air pathway formed from a first supply port in a side wall of said pressure foot; a plurality of first blow-out ports formed in a contact surface of said pressure foot with the printed circuit board and communicating with the first air pathway, the first supply port being connected

with a pressure air source; a second air pathway extending from a second supply port formed in the side wall; a plurality of second blow-out ports opened toward an



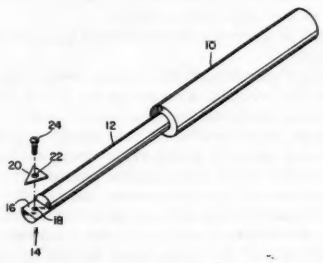
interior of said pressure foot and communicating with the second air pathway, said second air pathway being in communication with a supply source of pressurized air.

5,024,563

CUTTING APPARATUS

Joseph G. Randall, Concord, Mass., assignor to North East Form Engineering, Inc., Lowell, Mass.

Filed Sep. 8, 1989, Ser. No. 404,952
Int. Cl.[5] B23B *51/00*
U.S. Cl. 408—1 R **9 Claims**



1. Boring apparatus comprising:

a cutting piece having an aperture therethrough;

a handle having one end adapted to hold the cutting piece, the one end having an aperture alignable with the cutting piece aperture; and

a multiple start screw disengageably positioned in the apertures of the cutting piece and handle, for securing the cutting piece to the one end of the handle in a manner which prevents loosening and relative movement between the cutting piece and the handle during use by exerting from different sides of the screw equal pressures to the cutting piece.

8. A method of boring comprising the steps of:

positioning a cutting piece to a desired cutting position on a handle adapted to hold the cutting piece, the cutting piece having an aperture therethrough and the handle having an aperture alignable with the cutting piece aperture;

securing the cutting piece, in the desired cutting position, to the handle with a multiple start screw disengageably positioned in the apertures of the cutting piece and handle, the multiple start screw exerting equal pressures from different sides of the screw to the cutting piece to enhance securing and prevent slippage during use, said securing forming a boring tool; and

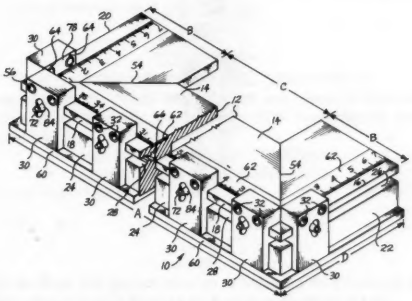
operating the boring tool on material of interest to bore desired holes in the material.

5,024,564

DOWEL DRILLING JIG

Larry K. Lloyd, 19708 65th Ave. East, Spanaway, Wash. 98387

Filed Nov. 13, 1989, Ser. No. 436,069
Int. Cl.[5] B23B *47/28*
U.S. Cl. 408—115 R **14 Claims**



1. A dowel jig for positioning a workpiece to guide the drilling of corresponding holes therein at preselected locations, said jig comprising:

a workpiece-supporting platform having a top surface and a pair of adjacent side edges extending substantially transverse each other and substantially transverse said top surface, said side edges of said platform being positioned for alignment with separate noncoplanar surfaces to be drilled on said workpiece;

a guideway extending along and adjacent to each of said side edges and being positioned entirely relatively below said top surface; and

a plurality of drill guides each including a guide opening and adapted to be removably engaged with said guideway and positionable at preselected locations along a selected one of either of said side edges and not engaging the nonselected side edge, each said drill guide including a portion which projects relatively upwardly beyond said top surface, said guide opening being positioned in said upwardly projecting portion,

wherein said workpiece may be positioned on said top surface and against said drill guides for drilling of holes in said workpiece substantially parallel to said top surface through a guide opening in each said drill guide.

5,024,565

HAND TOOL

Henry Pinand, 80 Upper Hibernia Rd., Rockaway, N.J. 07866

Filed Aug. 20, 1990, Ser. No. 569,203
Int. Cl.[5] B23B *45/06;* **B25B** *15/06*
U.S. Cl. 408—121 **14 Claims**

1. A hand tool for removing burrs from an aperture in a workpiece, comprising:

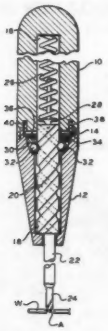
a hollow handle having a race;

a shaft rotatably mounted in said handle to reciprocate axially therein;

thrust means for urging said shaft to extend axially;

rolling means mounted in said race in said handle for engaging and rolling on said race and on said shaft to rotate said shaft as it extends axially from said handle, said rolling

means being operable to allow axial retraction of said shaft into said handle without rotation; and



a deburring bit mounted at an outer end of said shaft, so that said bit turns when said shaft extends as said handle withdraws from said workpiece.

5,024,566

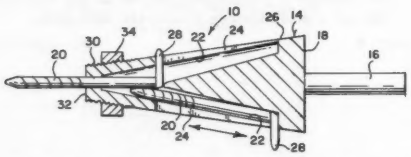
ALL IN ONE DRILL BIT

Guy F. Ippolito, 7322 Bent Oak Dr., Port Richey, Fla. 34668, and George Spector, 233 Broadway RM 3815, New York, N.Y. 10007

Filed Feb. 17, 1989, Ser. No. 311,971

Int. Cl.[5] B23B *51/12*

U.S. Cl. 408—197 **5 Claims**



1. A selective drill bit attachment for a standard portable electric drill having a chuck head, said attachment comprising:

a) a frustum cone shaped housing with a wide end and a jaw with a narrow end having a shank extending rearwardly from said wide end thereof for removably connecting said housing to the chuck head of the standard portable electric drill;

b) a plurality of different sized drill bits carried within said housing; each one of said bits selectively movable to an operable position in which a cutting end of the selected on bit protrudes from the narrow end of said housing;

c) means within said housing for selecting and manually extending each of said drill bits into said operable position and

d) means on said narrow end of said housing for clamping said jaw on said selected drill bit in said operable position so as to be used by the standard portable electric drill.

5,024,567

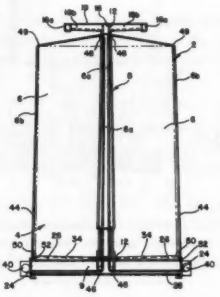
CENTER BEAM/CENTER PARTITION FLAT CAR AND RETENTION ASSEMBLY

Danilo A. Dominguez, 1867 Piedras Cir., Danville, Calif. 94526, and James F. Flores, 4 Overhill Rd., Mill Valley, Calif. 94941

Filed Oct. 17, 1989, Ser. No. 422,746

Int. Cl.[5] B61D *45/00*

U.S. Cl. 410—100 **12 Claims**



1. A center beam/center partition flat railcar comprising

body means including a longitudinal center sill and a plurality of side sill assemblies lying in parallel relationship on opposite sides of said center sill, said body means further having an upper beam assembly supported on vertical members arranged above said center sill,

floor means arranged adjacent said center sill and said plurality of side sill assemblies for carrying the lading on both sides of said upper beam assembly,

a plurality of tensioning means mounted along each side sill assembly,

a plurality of elongated members being respectively retained at one end portion to a respective one of said plurality of tensioning means and having a free end, and

securement means positioned substantially adjacent said tensioning means for selectively retaining said free end of a respective one of said elongated members at a position adjacent to said tensioning means, said plurality of elongated members being arranged to extend below, upward along a first side, over the top and downward along a second side of the lading being carried by said floor means, said free end being removeably retained by said securement means when the plurality of elongated members are extended over the top and along the second side of the lading.

5,024,568

BULK MATERIAL RECLAIMING APPARATUS

William H. Johnston, Montreal, Canada, assignor to The CSL Group Inc., Montreal, Canada

Continuation of Ser. No. 172,584, Mar. 24, 1988, abandoned, which is a continuation of Ser. No. 793,923, Nov. 1, 1985, Pat. No. 4,738,578, which is a continuation-in-part of Ser. No. 713,724, Mar. 19, 1985, abandoned. This application Nov. 1, 1989, Ser. No. 432,413

Claims priority, application Canada, Jan. 29, 1985, 473025

Int. Cl.[5] B63B *27/00*

U.S. Cl. 414—142.2 **10 Claims**

1. An apparatus adapted to be fitted to a bulk solid storage container for reclaiming material from that container, comprising:

(a) A gantry adapted to be mounted on and movable along a track adjacent to the top of the container;

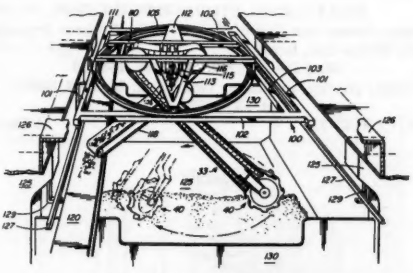
(b) a boom assembly mounted on the gantry and being comprised of a boom and a boom support structure, the boom having one end region pivotally connected to the boom

support structure and being movable in a vertical plane about a horizontal axis;

(c) a bucket wheel rotatable about an axis parallel to the horizontal axis being mounted on the other end region of the boom together with first rotatable drum means;

(d) a flexible belt extending in a closed loop along the boom and around the first drum means and also around second drum means on said boom support structure, the belt having pockets spaced apart therealong on the inwardly facing surface of the belt for receiving bulk material from the bucket wheel and conveying the bulk material along said boom to a region of dischargè, characterized in that

(e) said first drum means includes a pair of annular members each extending inwardly from opposing ends of said first drum means; and said flexible belt travelling along the boom longitudinally and being supported in its passage around the other end of the boom by said rotatable first drum means, the belt having a pair of flexible side members extending along its inner surface generally perpendicular to that inner surface, each flexible side member extending parallel to but spaced from a respective edge of the belt, the belt being supported in its movement around the first drum means by said pair of annular members which extend from opposite ends of the first drum means, that edge portion of the inner surface of the belt extending between a flexible side member and the respective edge of the belt riding on a respective one of the annular members during movement of the belt around the first drum means,



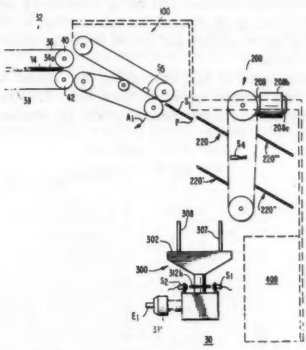
a series of slat members extending between the flexible side members and projecting outwardly from the inner surface of the belt in spaced relation to each other so as to form a series of said pockets along the inner surface of the belt, which pockets are flexible, so that bulk material gathered by the bucket wheel during its rotation is deposited on the inner surface of the belt within said flexible pockets as the belt moves around the first drum means on said other end region of the boom, the material being retained in the flexible pockets along the inner surface of the belt as the belt moves along said closed loop, the boom being capable of pivotal motion about said horizontal axis from a lowered position wherein the boom is substantially upright to a raised position wherein the boom is substantially horizontal, said bucket wheel having a plurality of scoop channels each having a mouth connected to a guide surface which directs bulk material entering the mouth radially and laterally inwardly on the bucket wheel during rotation thereof such that said material falls into said flexible belt pockets with the bulk material being transferred without substantial spillage from the bucket wheel into said belt pockets as the belt pockets move away from the first drum means regardless of the position of the boom between the raised and lowered positions; and in which said region of discharge is defined by said second drum means, the latter including a spaced apart pair of drums each having a pair of annular members extending from opposite end of each of said drums for supporting the belt, each edge portion of the inner surface of the belt which extends between the flexible side member and the respective edge of the belt riding on a respective one of said annular members of each of said pair of drums during movement of the belt around those drums, said pair of drums being constructed and arranged on the boom support structure such that material retained in the flexible pockets along the inner surface of the belt is emptied from that pocket by gravity and centrifugal force as the pocket moves between said pair of drums.

5,024,569

STACKING METHOD AND APPARATUS

Leonard A. Watts, North Miami Beach, and Medardo Espinosa, Hialeah, both of Fla., assignors to EDS Technologies, Inc., Hialeah, Fla.

Filed Jun. 20, 1986, Ser. No. 876,490
Int. Cl.[5] B65G *57/09*; B65H *29/14*
U.S. Cl. 414—790.3 **66 Claims**



41. A method of stacking signatures comprising:

conveying signatures on an infeed conveyor to an intercept position;

driving a signature support of a batcher from an intercept ready position to the intercept position with a servomotor for intercepting signatures conveyed from the infeed conveyor; and

tracking movement of the signature support of the batcher from the intercept ready position to the intercept position with an encoder. conveyor.

5,024,570

CONTINUOUS SEMICONDUCTOR SUBSTRATE PROCESSING SYSTEM

Tadashi Kiriseko, Kanagawa; Hiromichi Tani, Kawasaki; Noriko Soma, Yokohama; Nobuhisa Shigemi, Kawasaki, and Takayuki Toyoda, Yokkaichi, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 6, 1989, Ser. No. 403,355
Claims priority, application Japan, Sep. 14, 1988, 63-230578; Jun. 30, 1989, 1-168333
Int. Cl.[5] B65H *85/00*
U.S. Cl. 414—222 **11 Claims**

1. A continuous semiconductor wafer processing system for continuously performing a plurality of process steps, in accordance with one or more predetermined sequences of such process steps, on one or more lots of semiconductor wafers, comprising:

a wafer conveying mechanism;

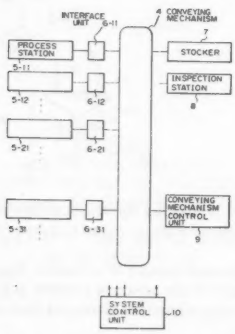
plural carriers and means for moving each carrier independently of the conveying mechanism, each carrier having a capacity of receiving up to a predetermined number of semiconductor wafers to be conveyed thereby and being

configured for automated transfer of semiconductor wafers to and from the carrier;

plural process stations for performing plural, successive process steps on semiconductor wafers to be processed by the processing system, each process station performing a respective, predetermined one of the process steps;

plural interface units respectively associated with said plural process stations, each interface unit coupling the respectively associated process station to the conveying mechanism and comprising a wafer discrimination section for discriminating semiconductor wafers, a buffer section for temporarily storing discriminated semiconductor wafers and adapted for mounting a carrier therein and being operable for selectively transferring semiconductor wafers to and from the carrier, and a transfer mechanism, the transfer mechanism of each interface unit coupling the conveying mechanism and the respectively associated process station and being selectively operable for transferring semiconductor wafers therebetween, the transfer mechanism being coupled to each of the buffer and wafer discrimination sections and being selectively and jointly operable with each thereof for transferring wafers to and from the buffer section and to and from the wafer discrimination section;

a stocker coupled to said conveying mechanism and selectively and jointly operable therewith for transferring semiconductor wafers therebetween, the stocker temporarily storing the semiconductor wafers, as transferred thereto, during time intervals intermediate the performance of successive processing steps thereon, the stocker comprising a wafer discrimination section for discriminating semiconductor wafers, a carrier feed-in/feed-out section adapted for mounting of a carrier therein and selectively operable for transfer of semiconductor wafers therebetween, a wafer storage section, and a transfer mechanism, the transfer mechanism being coupled to the conveying mechanism and being selectively operable therewith for transferring semiconductor wafers therebetween, and being coupled to each of the wafer storage section, the wafer discrimination section and the carrier feed-in/feed-out section and selectively and jointly operable with each said section for transfer of semiconductor wafers therebetween;



conveying mechanism control means for controlling the conveying mechanism, selectively, to convey semiconductor wafers to and from each of the respectively associated process stations and interface units and to and from the stocker; and

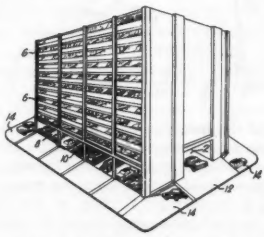
system control means, operable in accordance with a predetermined processing program which defines said one or more predetermined sequences of process steps to be performed on corresponding, discriminated lots of semiconductor wafers, for communicating with and thereby monitoring and controlling each of the interface units and respectively associated process stations, the stocker, and the conveying mechanism control means, selectively for each discriminated lot of semiconductor wafers and in accordance with the next process step of the sequence to be performed thereon, the system control means selecting the corresponding process station for performance of that next process step on each such discriminated lot and controlling the conveying of each such lot to the corresponding, selected process station, the transferring of each such lot by the transfer mechanism of the respectively associated interface unit to the selected process station for performance of the process step thereon and, upon completion of the performance of the process step, the transferring of each such lot from the process station and the further conveying thereof, alternatively, to a next selected process station or to the stocker for transfer thereto and temporary storage therein, and the transferring of each such lot from the stocker and the subsequent conveying thereof to a next process station, said system control means selectively controlling said conveying mechanism to effect said conveying and, alternatively, issuing instructions for moving each said carrier and thereby conveying the semiconductor wafers received therein, from and to successive, next selected process stations and said stocker, for all said lots of semiconductor wafers and in accordance with a priority order of processing of same as defined by the predetermined processing program.

5,024,571

MULTI-LEVEL STORAGE STRUCTURE

Moshe Shahar, and Gabriel Shahar, both of Sderot Jerusalem 96, Ramat-Gan, Israel

Filed Dec. 21, 1989, Ser. No. 454,590
Claims priority, application Israel, Dec. 26, 1988, 88806
Int. Cl.[5] B65G *65/00*
U.S. Cl. 414—231 **14 Claims**



1. An automatic multi-level storage structure comprising:

a building structure having at least one entrance and exit station for respectively introducing an object for the storing thereof and withdrawing said object after retrieval thereof, a main floor directly accessible from said entrance station, and a plurality of storage levels:

a plurality of object pallets provided with wheels and adapted to carry objects to be stored, said pallets being movable along, and guided by, first track means fixedly attached to a floor of each level;

at least one storage elevator adapted to accommodate at least one of said object pallets at a time and vertically movable between said main floor and said plurality of storage levels;

at least one transfer platform permanently located in said at least one elevator and provided with second track means fixedly attached to said platform, said second track means adapted to accept and guide the wheels of said object pallet, and further provided with first drive means for moving said object pallet onto said transfer Platform and subsequently moving it off said platform,

second drive means for engaging said transfer platform enabling it to move longitudinally in both directions be-

yond the limits of said elevator far enough to ensure continuity, either on one side of said elevator or on the other side thereof, between said first track means fixedly attached to said floor of each level, and said second track means fixedly attached to said transfer platform, and

wherein an object to be stored is moved onto one of said object pallets at said at least one entrance station and, for the duration of its stay in said storage structure, remains standing on said one of said object pallets, and said one of said object pallets being moved from an entrance station onto an elevator and from said elevator to a storage location on one of said levels and subsequently from said storage location, via said elevator, to said exit station.

5,024,572

GOODS HANDLING METHOD AND APPARATUS THEREOF

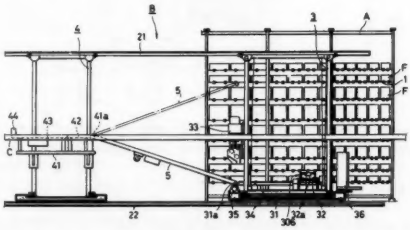
Nobuhiro Tanaka, Miyashiro; Eiji Hirata, Koshigaya; Hideyuki Moriguchi, Miyashiro; Ko Azekura, Funabashi; Akira Tsubone, Kita Kyushu, and Yasunori Ryu, Koga, all of Japan, assignors to Kao Corporation, Tokyo and Seibu Electric & Machinery Co., Ltd., Fukuoka, both of Japan

Continuation of Ser. No. 184,091, Apr. 20, 1988, abandoned, which is a division of Ser. No. 886,241, Jul. 16, 1986. This application Jan. 8, 1990, Ser. No. 464,679

Claims priority, application Japan, Jul. 16, 1985, 60-156354; Jul. 16, 1985, 60-156355; Mar. 7, 1986, 61-49694; Mar. 20, 1986, 61-60883; Mar. 26, 1986, 61-67738; May 13, 1986, 61-109253; May 13, 1986, 61-109254

Int. Cl.[5] B65G *65/00*

U.S. Cl. 414—276 **4 Claims**



1. A goods handling apparatus for carrying in goods with respect to storage facilities having multirow and multistage storing spaces, said apparatus including a goods inlet apparatus adapted to carrying in goods by travelling in a vertical direction and in a horizontal direction along said storing spaces of said storage facilities, a goods carrier conveyor adapted to convey the goods within a plane parallel to a travelling plane of said goods inlet apparatus, a goods transfer conveyor adapted to connect said goods inlet apparatus to said goods carrier conveyor, said inlet apparatus being placed on a lifting section of a stacker crane which is movable in the horizontal direction along the storing spaces of said storage facilities, said goods transfer conveyor having a first end oscillatably mounted to said stacker crane for movement according to the lifting of said lifting section, and a second end thereof is positioned at the same height as said goods carrier conveyor, said goods carrier conveyor is disposed generally horizontally and generally the height of a storing space of a central stage located at an intermediate height level of the storage facilities,

a movable conveyor located between said first end of said goods transfer conveyor and said inlet apparatus to receive goods from said first end of said goods transfer conveyor and transmit them to said inlet apparatus,

said first end of said goods transfer conveyor being engaged with a vertically movable end of said movable conveyor,

said vertically movable end of said movable conveyor being supported by resilient means for movement to a second position, said resilient means returning said movable conveyor to its initial position after the passage of goods, and

said first end of said goods transfer conveyor and said movable conveyor being mounted on said lifting section so that due to the lifting of said lifting section, said goods transfer conveyor is oscillated about said first end.

5,024,573

LIFTING DEVICE

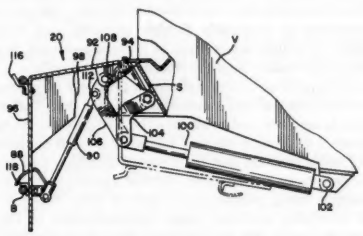
John W. Redding, Brookfield, and Robert F. Zelinka, Roselle, both of Ill., assignors to Perkins Manufacturing Company, Chicago, Ill.

Continuation-in-part of Ser. No. 126,593, Nov. 30, 1987, Pat. No. 4,911,600, which is a continuation of Ser. No. 862,015, May 12, 1986, Pat. No. 4,741,068, which is a continuation of Ser. No. 572,389, Jan. 20, 1989, abandoned. This application Nov. 17, 1988, Ser. No. 272,765

The portion of the term of this patent subsequent to May 3, 2005, has been disclaimed.

Int. Cl.[5] B65F *3/02*

U.S. Cl. 414—408 **14 Claims**



1. A refuse collection vehicle comprising:

means defining a refuse receiving cavity, including sidewalls and a floor extending upwardly to a lower sill edge;

a receptacle lifter movably mounted below said sill, said lifter including means for capturing a portion of a selected type of receptacle;

means cooperatively associated with said lifter for moving said lifter between a first lifter position and a second lifter position, said lifter being located substantially entirely below a horizontal plane tangent to said sill edge and substantially entirely on the cavity side of a vertical plane tangent to said sill edge when in said first lifter position, wherein lateral access to said sill edge from a side of said vertical plane opposite said refuse receiving cavity is substantially unobstructed and said second position being above said sill edge for dumping a selected type of receptacle;

said means for capturing a portion of a selected type of receptacle being movable between a capture position for capturing a portion of the selected type of receptacle and a release position for releasing the receptacle portion; and

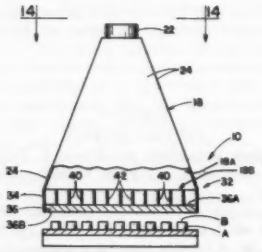
means cooperatively associated with said lifter moving means and said capture means for moving said capture means between said first and second positions, including automatically adjusting variable length means connecting said capture means and said moving means, said automatically adjusting variable length connecting means being resiliently biased to a reduced length position.

5,024,574

RANDOM FUEL PELLET VACUUM TRANSFER APPARATUS

John F. Wilson; Enrique R. Rosal, both of Columbia, S.C., and George D. Bucher, North East, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 29, 1989, Ser. No. 373,074
Int. Cl.[5] B65B *21/02*
U.S. Cl. 414—416 9 Claims



1. A vacuum transfer apparatus for use in en mass vacuum gripping nuclear fuel pellets, said apparatus comprising:

(a) an enclosure defining a vacuum chamber and having an open bottom;

(b) a rigid support structure spanning and attached to said open bottom of said enclosure; and

(c) a perforated mat attached to said structure along a side thereof opposite from said hood enclosure, said mat being composed of resiliently flexible material and having a matrix of spaced apart holes of a cross-sectional size substantially smaller than the diameter of the pellets;

(d) said support structure defining a plurality of passages of a cross-sectional size substantially larger than that of said holes in said mat and providing the sole path for communicating a vacuum from said chamber of said enclosure to said holes inn said mat for vacuum gripping and holding the pellets at end surfaces thereof against said mat, said passages being permnanently open at their opposite ends for providing constant open communication of the vacuum from said vacuum chamber to said perforated mat;

(e) said support structure being composed of a criss-crossed arrangement of parallelly-disposed and spaced apart strips wherein the thickness of the surface of said strips which is in contact with said mat is less than the diameter of said holes in said mat such that said strips will not completely cover and thus block communication of a vacuum through any of said holes in said mat.

5,024,575

LIGHTWEIGHT GRIPPER FOR ROBOTIC TRANSFER OPERATIONS

Roger Anderson, Ridgefield, Conn., assignor to Robotic Originals, Inc., Danbury, Conn.

Filed Sep. 8, 1989, Ser. No. 405,634
Int. Cl.[5] B65G *61/00*
U.S. Cl. 414—627 11 Claims

1. A light weight, re-configurable gripper for pick up, translational and rotational and rotational repositioning and deposit of a plurality of product items under robotic manipulation, which comprises

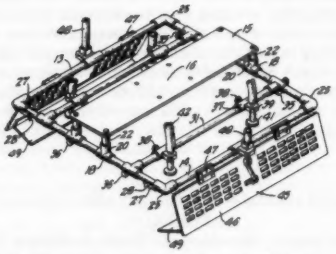
(a) a basic frame comprising a pair of spaced, longitudinally extending lateral supports formed of lightweight tubular material, and means rigidly interconnecting said lateral supports,

(b) a plurality of cross members slidably supported by and extending between said lateral supports,

(c) said cross members being formed of lightweight tubular material and mounting a T-shaped fitting at each end,

(d) said T-shaped fittings being tightly secured to said cross members and slidably mounted on said lateral supports for adjustable positioning of the cross members,

(e) a plurality of clamping members slidably mounted on said cross members for adjustable positioning thereon,



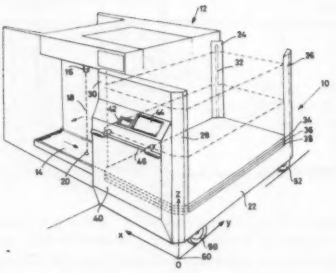
(f) a suction device mounted on each of said clamping members for engagement with a product item to be transported.

5,024,576

WORKING METHOD OF AN AUTOMATIC SERVICE TRUCK FOR MOVING SHEET PACKAGES

Luciano Meschi, Livorno, Italy, assignor to Industria Grafica Meschi S.r.l., Livorno, Italy

Filed May 31, 1989, Ser. No. 359,350
Claims priority, application Italy, Jun. 2, 1988, 20836 A/88
Int. Cl.[5] B65G *67/00*; B60P *1/52*
U.S. Cl. 414—786 2 Claims



1. A method for loading an automatic service truck (10) associated with a tern (60) of cartesian axes having an origin in a given point on said truck for moving or carrying paper sheets packages in which a plurality of said packages are arranged side by side and superimposed one above the other according to how many package layers are loaded, comprising the steps of:

(a) supplying and loading along a first direction a first package to a first location on a first plane (34) of said truck, said first package being loaded onto said truck (10) along a first axis (x), then loading a second package along said first axis (x) which pushes the first package to go adjacent to the origin of said tern (60), to fill completely the available space along said first axis (x) on said first plane;

(b) shifting the truck (10) along a second axis (y) perpendicular with respect to the first axis (x) and providing a space large enough to house a second row of packages side by side arranged along said first axis (x) until the available space along the first axis (x) is completely filled, said first axis (x) and said second axis (y) defining said first plane (34);

(c) subsequently shifting the truck (10) along said second axis (y) again for housing on said first plane (34) four rows of packages side by side arranged along said first axis (x);

(d) lifting said first plane (34) along a third axis (z) at the end of the shifting along said second axis (y), said third axis (z) being perpendicular with respect to said first plane (34) defined by said first two axes (x, y), said first plane being lifted along said third axis (z) after being completely filled with packages to make available a second plane (36) onto which is loaded a second group of packages, according to the (a), (b) and (c) steps, until said second plane is completely filled; and

(e) lifting said first and second planes (34 and 36) together concurrently along said third axis (z) to make a third plane (38) available to be filled with sheet packages exactly as the first and second planes (34 and 36), said third plane (38) being delimitated by said first and said second axes (x, y), to be filled with a third group of packages according to the procedure used in the steps (a) to (c) for filling said first plane (34), the packaging collection on said truck (10) terminating when said third axis (z) is completely filled.

5,024,577

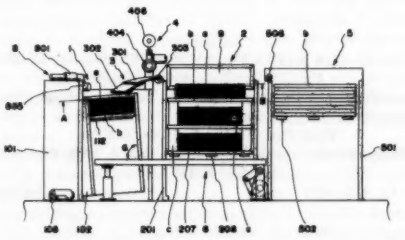
PAPER ARRANGING SYSTEM

Isamu Miura, 16-6, Ryusen 3-chome, Taitoh-ku, Tokyo, Japan

Filed Jul. 5, 1989, Ser. No. 375,438

Int. Cl.[5] B65H *29/22*

U.S. Cl. 414—788.4 **11 Claims**



1. A paper arranging system for re-loading a bundle of paper sheets from a paper feed rack to a paper arranging device, comprising:

a paper feed rack having a front, a rear, and two sides for initially receiving a bundle of paper sheets;

a paper arranging device located adjacent to said paper feed rack for receiving and stacking said bundle of paper sheets after said bundle of paper sheets has been transferred from said paper feed rack to said paper arranging device; means for conveying said paper sheets from said paper feed rack to said paper arranging device;

a working platform pivotably disposed in front of said paper feed rack and said paper arranging device and means for moving said working platform between a first horizontally disposed position at which an operator may be supported thereon for performance of a paper stacking operation, and a second vertically disposed position at which said platform is moved away from said front of said paper feed rack and said paper arranging device so as to provide clear access to said paper feed rack and said paper arranging device.

5,024,578

REGENERATIVE PUMP WITH TWO-STAGE STRIPPER

Ghanshyamsinh D. Vansadia, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 10, 1989, Ser. No. 419,297

Int. Cl.[5] F04D *5/00, 9/02*

U.S. Cl. 415—55.1 **4 Claims**

1. In an automotive fuel pump assembly, a regenerative rotary pump comprising:

a housing defining a circular cavity having a cylindrical side wall and a pair of circular end walls,

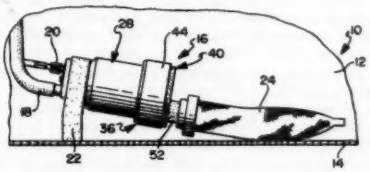
means on said housing defining a pair of annular grooves in respective ones of said circular end walls adjacent said cylindrical side wall and cooperating with said cylindrical side wall in defining an annular pumping chamber,

a disc-shaped impeller supported in said circular cavity for rotation in a pumping direction,

means on said impeller defining a plurality of circumferentially spaced vanes around said impeller in said pumping chamber separated by a plurality of pockets open to said pumping chamber,

means on said housing defining a fluid inlet connected to said pumping chamber and to a source of fluid at substantially ambient pressure,

means on said housing defining a fluid discharge from said pumping chamber angularly spaced from said inlet in said pumping direction of rotation of said impeller and connected to a flow restriction downstream of said fluid discharge so that said vanes cooperate with said pumping



chamber in motivating said fluid from said inlet toward said discharge and in increasing the pressure of said fluid at said discharge,

means on said housing defining a high pressure stripper stage adjacent said discharge closely receiving said impeller so that direct communication between said discharge and said inlet in said pumping direction of rotation of said rotor is foreclosed,

means on said housing defining a low pressure stripper stage between said high pressure stripper stage and said inlet closely receiving said impeller,

means on said housing defining a vent chamber between said high pressure stripper stage and said low pressure stripper stage exposed to said pockets on said impeller, and

means defining a vapor bleed between said vent chamber and said source of fluid at ambient pressure at a location removed from said inlet.

5,024,579

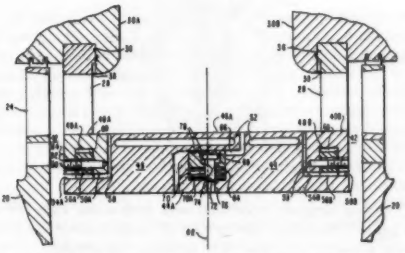
FULLY FLOATING INLET FLOW GUIDE FOR DOUBLE-FLOW LOW PRESSURE STEAM TURBINES

John C. Groenendaal, Jr., Winter Springs, and Randy T. Rudy, Orlando, both of Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 18, 1990, Ser. No. 553,517

Int. Cl.[5] F01D *25/26*

U.S. Cl. 415—108 **6 Claims**



1. In a double flow steam turbine having a rotor with annular

rows of blades disposed about its periphery, a stator assembly connected about the rotor and having annular rows of stationary blades affixed thereto, the stator assembly including a steam inlet for directing a flow of steam onto at least a pair of first stage stationary blade rows in a desired steam flow path, each of the first stage stationary blade rows being positioned on opposite sides of the steam inlet and located for directing the flow of steam onto corresponding rows of rotor blades, at least the first stationary blade rows having an inner blade ring, apparatus for improving the efficiency of the steam turbine by reduction of steam bypassing the first stage blade rows via leakage around the inner blade rings including sealing means coupled between the inner blade rings of the first stage stationary blade rows, the sealing means including a first circumferential band coupled in sealing relationship to the inner blade ring of one of the first stage stationary blade rows and a second circumferential band coupled in sealing relationship to the inner blade ring of the other of the first stage stationary blade rows, at least a portion of the first band underlying at least a portion of the second band, a resilient seal positioned between the overlapping portions of the first and second bands and operative to prevent the leakage of steam therebetween, each of the first and second bands being connected to a corresponding one of the first stage stationary blade rows by connecting means allowing differential radial thermal expansion and contraction between the band and associated blade row, said connecting means comprising a circumferential groove formed in a radially inner surface of each of the inner blade rings, a tongue formed on each of the first and second bands and positioned to fit within a corresponding one of the grooves when the bands are assembled to a respective one of the inner blade rings, each of the tongues having a plurality of circumferentially spaced slots, a block positioned in each of the slots, each block being of a size to slidingly engage opposite circumferential sides of the slot and being shorter than a depth of the slot, the blocks being located within the groove when the bands are assembled to the inner blade rings, a plurality of pins each extending through the groove and a corresponding one of the blocks for fixing the blocks to the inner blade ring, whereby sliding motion of each of the blocks within its respective slot allows differential radial motion of the first and second bands with respect to their respective first and second inner blade rings while preventing circumferential rotation of the bands with respect to the blade rings.

5,024,580

CONTROL OF VARIABLE STATOR VANES

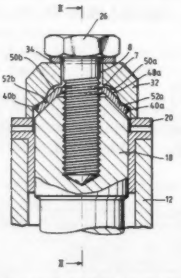
Clive E. Olive, Bristol, England, assignor to Rolls-Royce plc, London, England

Filed Jun. 15, 1990, Ser. No. 538,784

Claims priority, application United Kingdom, Jun. 17, 1989, 8913988

Int. Cl.[5] F01D *17/00, 9/00*

U.S. Cl. 415—150 **5 Claims**



1. A vane actuator associated with each stator vane for use in a gas turbine engine having a set of variable stator vanes and a vane actuator ring, said vane actuator comprising:

an elongated metal vane actuator lever linking a vane stem to the ring, said lever being pivotally attached at one end to the ring and at the other end clamped to a respective vane stem so as to inhibit relative movement between said lever and the stem, said lever further comprising a first portion in the form of a strip extending from the ring towards the stem and a second portion in the form of a trough adapted to locate on a cooperatively shaped end of the stem; and

a clamp means to prevent relative movement between the stem and said lever, the arrangement being such that when the ring is rotated about its axis the strip portion of the lever is able to twist about its longitudinal axis and inhibit any tendency of the lever as a whole to twist about its longitudinal axis.

5,024,581

DEVICES FOR REDUCING DEFLECTION AND STRESS IN TURBINE DIAPHRAGMS

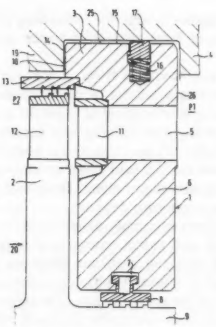
Gérard Foucher, Tremblay les Gonesse, France, assignor to GEC Alsthom SA, Paris, France

Filed Oct. 2, 1989, Ser. No. 415,731

Claims priority, application France, Oct. 6, 1988, 88 13117

Int. Cl.[5] F01D *9/04*

U.S. Cl. 415—191 **6 Claims**

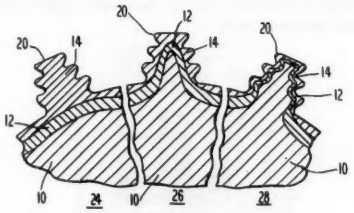


1. A turbine comprising at least one stage having a diaphragm which is split in two along a diametrical plane and which includes an outer ring and an inner ring interconnected by means serving to guide the turbine fluid, a downstream face of the outer ring being pressed against a ring of the turbine stator, said diaphragm being provided with sealing means providing sealing between the outer ring and the stator, wherein said sealing means are disposed on the outer edge of the outer ring, wherein the downstream face of said outer ring is provided with a land at a distance from the outer edge and bearing against the ring of the stator, and wherein communication means are provided for providing communication between the space situated between the land and the sealing means, and a space downstream from the diaphragm with the pressure in said space being less than the pressure P_1 existing over the upstream face of the diaphragm.

5,024,582
STEAM TURBINE ROTOR HAVING GRADED WELDMENTS

James C. Bellows, Maitland, and Rudolph Koubek, III, Casselberry, both of Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 14, 1990, Ser. No. 567,032
Int. Cl.[5] F01D *1/00, 25/00*
U.S. Cl. 416—213 R 22 Claims



1. A steam turbine component comprising:

(a) a ring member comprising a low alloy ferrous base metal having less than about 6 wt. % alloying ingredients including Cr, Mo and V;

(b) a ferrous graded layer disposed on said ring member comprising a plurality of layered weldments in which there is disposed an increasing weight percentage of a layering metal containing Cr; and

(c) a steeple region including a Cr-containing steeple alloy disposed on said graded layer for optimizing a life extending property of said steeple region of the turbine component.

15. A method of preparing a steam turbine rotor for optimizing a life extending property of a steeple region of said rotor, comprising:

(a) providing a ring member comprising a low alloy ferrous base metal having less than about 6 wt. % alloying ingredients including Cr, Mo and V;

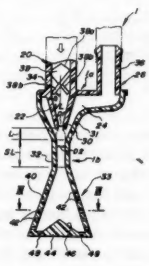
(b) disposing a ferrous graded layer onto said ring member, said ferrous graded layer comprising a plurality of layered weldments in which there is disposed an increasing weight percentage of a layering metal containing Cr;

(c) providing a steeple region including a Cr-containing steeple material disposed on said graded layer.

5,024,583
JET PUMP STRUCTURE FOR A FUEL TANK

Michiaki Sasaki, and Kazuya Yuki, both of Kanagawa, Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Dec. 1, 1989, Ser. No. 444,791
Claims priority, application Japan, Dec. 23, 1988, 63-326429
Int. Cl.[5] F04F *5/46*
U.S. Cl. 417—198 8 Claims



1. A jet pump structure for a fuel tank having first and second chambers therein comprising:

a vacuum chamber provided within the fuel tank;

first means, connected to said vacuum chamber, for returning oversupplied fuel to said vacuum chamber;

second means, connected to said vacuum chamber, for transferring fuel from the first chamber into said vacuum chamber;

third means, connected to said vacuum chamber, for receiving fuel from said first and second means;

fourth means, connected to said third means, for receiving fuel from said third means and discharging fuel into the second chamber; and

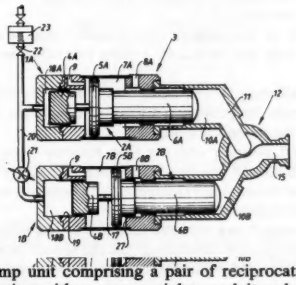
fifth means, provided with said first means, receiving the returning oversupplied fuel for forming the returning oversupplied fuel into a swirl flow of fuel, said swirl flow of fuel being ejected from said first means as a jet swirl flow of fuel into said vacuum chamber and forming a vacuum around said first means within said vacuum chamber, said ejected swirl flow of fuel sealing said vacuum chamber relative to said third means and preventing the vacuum generated within said vacuum chamber from being released through said third and fourth means, such that the vacuum effectively sucks fuel from the first chamber through said second means,

said fourth means including an expansion chamber having a frusto-conical shape including a tapered circumferential side wall extending from an open top of relatively small area to a bottom wall of a relatively large area, connected at said top to said third means for receiving the swirl flow of fuel from said third means, for providing a gradual pressure reduction to the swirl flow of fuel, and including a plurality of through holes in said circumferential side wall, each of said through holes extending substantially along a swirling direction of the swirl flow of fuel for discharging fuel into the second chamber.

5,024,584
PUMP UNIT WITH ADJUSTABLE PISTON STROKE LENGTH

Giorgio Bordini, and Maurizio Vincenzi, both of Modena, Italy, assignors to Tetra Dev-Co, Modena, Italy

Filed Nov. 30, 1988, Ser. No. 277,870
Claims priority, application Italy, Nov. 30, 1987, 22816 A/87
Int. Cl.[5] F04B *15/02, 1/28*
U.S. Cl. 417—342 7 Claims



1. A pump unit comprising a pair of reciprocating pumps communicating with a common inlet conduit and a common outlet conduit, said pair of reciprocating pumps each having a working piston mounted for reciprocating movement in a pump cylinder between an extended and a retracted position relative to said pump cylinder and a displacement piston and a hydraulic control piston, each of said pumps having a hydraulic control cylinder cooperating with said hydraulic control piston, pipe means interconnecting the hydraulic control cylinders of said pair of pumps to form a closed control system that includes a control fluid for synchronizing of said working pistons for alternating movement between said extended and retracted positions, pneumatic power means for providing a driving fluid for moving each of said displacement pistons

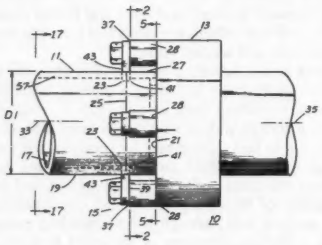
alternately toward said retracted position, wherein said pipe means is communicable to an oil supply through a valve such that a predetermined quantity of oil may be introduced into said control system in order to adjust the length of stroke of each working piston, said predetermined quantity being selected according to a desired length of stroke of each working piston and said predetermined quantity of oil remaining substantially unchanged for a particular desired length of stroke during operation of said pump.

5,024,585

HOUSING COUPLING MECHANISM

William M. Kralovec, Delavan, Wis., assignor to Sta-Rite Industries, Inc., Milwaukee, Wis.

Filed Apr. 9, 1990, Ser. No. 506,198
Int. Cl.[5] F04B *17/00*; F16L *23/032*
U.S. Cl. 417—360 **15 Claims**



1. An improved housing coupling mechanism including:
a non-pressurized, thin walled first housing having a non-flared first end and a plurality of perforate slots arranged in a spaced relationship about the perimeter of the first housing, each slot being disposed in a spaced relationship from the first end;
a second housing having a rabbet for aligning the first housing with respect to the second housing, such second housing being attached to the first housing in abutting contact to the first end, the second housing including a plurality of bosses integrally formed thereon, each boss being in overlapping relationship to the first end of the first housing, each boss being configured for coupling an attachment means thereto;
a plurality of attachment means, each being coupled to a single boss and including a plate extending to engage a slot;
each attachment means being positionally adjustable in a continuum for providing a force to couple the first housing to the second housing;
the second housing and the first housing being securely coupled to one another when each attachment means is adjusted to provide a clamping force between its plate and the slot engaged thereby;
the first housing being securely attached to and aligned on the second housing notwithstanding that the spaces between each slot and the first end of the first housing may be unequal to one another.

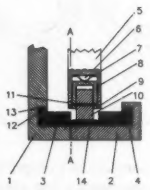
5,024,586

ACCURATE PERISTALTIC PUMP FOR NON ELASTIC TUBING

Samuel Meiri, 9438 Kedvale, Skokie, Ill. 60076

Filed Mar. 13, 1990, Ser. No. 492,860
Int. Cl.[5] F04B *43/12*
U.S. Cl. 417—477 **1 Claim**

1. A peristaltic pump comprising:
a motor driving a rotor, said rotor carrying a plurality of spring biased rollers on its circumference;
a semi-circular back wall, said semi-circular back wall having a fixed part and a rotatable moveable part;
a pair of elastic semi-circular sections are retained through the entire semi-circular back wall, the first of said elastic semi-circular sections retained in the fixed part and the second of said elastic semi-circular sections retained in the rotatable moveable part;
a peristaltic tube is mounted between said plurality of rollers of said rotor and said semi-circular back wall, along said tubes peripheral edges are said pair of elastic semi-circular sections which continuously elastically support said tube along the entire race;



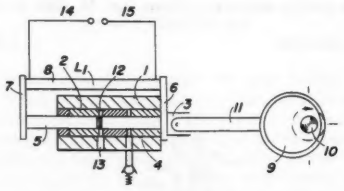
means for correcting the effects of creep in said peristaltic tube, wherein said means for correcting creep include said spring biased rollers, which apply a substantially constant force to pinch said tube, and said means for correcting creep further include said pair of elastic semi-circular sections which fully restore the initial cross-section of said tube in the areas of said race where said rollers are not pinching said tube; and
wherein said spring biased rollers apply a force which is substantially independent of minor tube wall thickness variations.

5,024,587

VALVELESS PUMP

Christoph Maurer, Ringstrasse, Fed. Rep. of Germany, assignor to Dräigerwerk Aktiengesellschaft, Lübeck, Fed. Rep. of Germany

Filed Dec. 26, 1989, Ser. No. 456,951
Claims priority, application Fed. Rep. of Germany, Jan. 12, 1989, 3900697
Int. Cl.[5] F04B *19/22*
U.S. Cl. 417—488 **10 Claims**



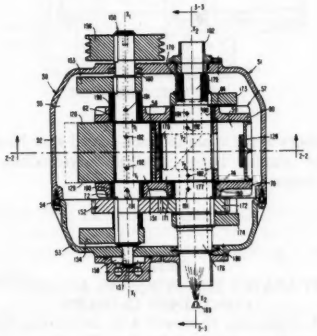
1. A valveless pump comprising a cylinder having spaced apart inlet and outlet ports, first and second opposed axially aligned pistons moveable in said cylinder, a fastening member connected to each of said first and second pistons, a moveable slide connected to both said fastening members, and variable length means connected to at least one of said fastening members so as to be carried by one of said fastening members for adjusting the distance between said first piston and said second piston at selected times.

5,024,588

ROTARY COMPRESSOR AND PROCESS OF COMPRESSING COMPRESSIBLE FLUIDS WITH INTAKE AND DISCHARGE THROUGH PISTON SHAFT AND PISTON

Marek J. Lassota, Des Plaines, Ill., assignor to Unotech Corporation, Villa Park, Ill.

Filed Sep. 7, 1989, Ser. No. 404,271
Int. Cl.[5] F04C *18/24, 29/02*
U.S. Cl. 418—1 **65 Claims**



1. In a rotary compressor of the type comprising:

a cylinder-piston comprising a body, two spaced walls extending from one end of said body and having opposing parallel surfaces, and a wall interconnecting said two spaced walls at their ends remote from said body to form an opening in said cylinder-piston, said cylinder-piston further having two side faces;

a piston positioned within said opening of said cylinder-piston and having spaced faces adjoining said opposing parallel surfaces of said spaced walls of said cylinder-piston, said piston further having two spaced side faces;

two axially spaced walls adjoining said side faces of said cylinder-piston and said spaced side faces of said piston;

a rotatable cylinder-piston shaft comprising an eccentric portion journaled in said body of said cylinder-piston;

a rotatable piston shaft comprising an eccentric portion journaled in said piston;

gearing means interconnecting said cylinder-piston shaft and said piston shaft so said shafts follow coordinated rotations in opposite directions and said cylinder-piston and said piston follow coordinated planetary rotations in opposite directions with and around said eccentric portions of said shafts;

said cylinder-piston and said piston forming moveable surfaces, and said axially spaced walls forming stationary surfaces of two compression chambers located between said body of said cylinder-piston and said piston and between said piston and said wall interconnecting said two spaced walls of said cylinder-piston and varying in volumes upon said coordinated planetary rotations in opposite directions of said cylinder-piston and said piston;

intake means comprising intake ports leading to said compression chambers; and

discharge means leading from said compression chambers,

the improvement comprising:

said intake and discharge means comprising:

at least one port in each end face of said piston serving as intake and discharge ports;

an intake channel in said piston shaft in communication with at least one intake port located in said eccentric of said piston shaft, said intake port in said eccentric of said piston shaft communicating with said ports in said piston and leading to said compression chambers at intake positions of said cylinder-piston shaft, said cylinder-piston, said piston shaft and said piston; and

a discharge port in said eccentric of said piston shaft in communication with a discharge channel of said piston shaft, said discharge ports of said piston communicating with said discharge port of said eccentric of said piston shaft and leading from said compression chambers at discharge positions of said cylinder-piston shaft, said cylinder-piston, said piston shaft and said piston; and

a suitable housing enclosing said compressor with said compressor attached to said housing;

a suitable pressure seal between the end of said discharge channel of said piston shaft and said housing of said compressor to seal flow of compressed air or gas between said end of said discharge channel of said piston shaft and said compressor housing; and

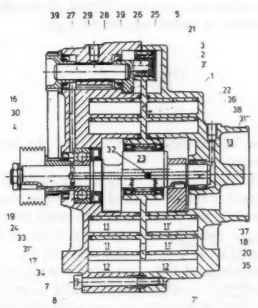
an opening in at least one of said parallel walls of said cylinder-piston, said opening being sequentially opened and closed during the operation of said compressor by said piston to provide communication between said compression chambers and inside of said housing of said compressor when said compression chambers are at or close to their maximum volumes.

5,024,589

SPIRAL DISPLACEMENT MACHINE HAVING A LUBRICANT SYSTEM

Gregor Jetzer, Nussbaumen; Roland Kolb, Dielsdorf, and Fritz Spinnler, Mellingen, all of Switzerland, assignors to Asea Brown Boveri Ltd., Baden, Switzerland

Filed Aug. 3, 1989, Ser. No. 388,822
Claims priority, application Switzerland, Aug. 3, 1988, 2939/88; Jun. 8, 1989, 2150/89
Int. Cl.[5] F04C *18/04, 29/02*
U.S. Cl. 418—55.3 **11 Claims**



1. A displacement machine for compressing fluids, comprising:

a housing;

a rotor in said housing;

a drive shaft journalled in said housing and having first eccentric means for oscillating said rotor about the drive shaft axis;

a guide shaft rotatably coupled to said drive shaft and journalled in said housing by a slide bearing, said guide shaft having second eccentric means for guiding the oscillation of said rotor;

spiral means on said housing and said rotor for compressing a fluid during oscillation of said rotor; and

a lubricating system comprising:

a) means for supplying lubricant to said slide bearing,

b) drive shaft lubricating means, and

c) an intermediate line connecting lubricant outlets from said slide bearing to said drive shaft lubricating means,

whereby radial play in said slide bearing accommodates

variations in a spacing between said drive shaft and said guide shaft.

5,024,590

ROTARY ENGINE OF THE TYPE HAVING A PLANETARY ROTOR WITH ROTOR AND SHAFT EQUAL ROTATION

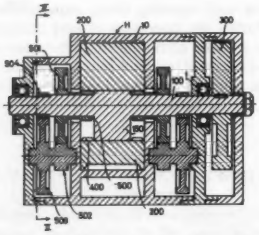
Sofyan Adiwinata, Jalan Kebalan VII No. 3, Kebayoran Baru, Jakarta, Indonesia

Continuation of Ser. No. 98,189, Sep. 17, 1987, abandoned. This application May 9, 1989, Ser. No. 349,873

Claims priority, application European Pat. Off., Sep. 18, 1986, 86201617.7

Int. Cl.[5] F01C *1/22, 17/02*

U.S. Cl. 418—61.2 4 Claims



1. An apparatus equipped with a rotary engine comprising a housing defining a cavity with a n-lobed epitrochoidal shaped wall, a n+1 lobed rotor within said cavity and movable in a planetary fashion, n being 1, 2, 3, . . . and a main crank shaft with an eccentric supporting said rotor, the rotor being provided with an internal involute gear meshing with an internal involute gear pinion rotatably supported by the main crank shaft, the engine further comprising a transmission installed between the rotor and the main crank shaft, the transmission rotation of which is based on the formula

$$\frac{IIGP}{IIG} - \frac{a}{b} = P$$

in which

IIGP refers to the pitch diameter of the internal involute gear pinion,

IIG refers to the pitch diameter of the internal involute gear,

a/b designates the additional rotation of the internal involute gear on each rotation of the main crank shaft, and

p is the basic ratio for the specific type of rotary engine, being equal to $\frac{1}{1}$, $\frac{2}{1}$, $\frac{3}{1}$, . . . for a 1-, 2-, 3-, . . . respectively lobed epitrochoidal shaped cavity wall, such that during rotation of the rotor the shape of the outer envelope of the rotating rotor is exactly the same as the shape of the wall of the cavity and wherein when n is one a/b is 1/6, when n is two a/b is 1/12 and when n is three a/b is 1/20.

5,024,591

VANE COMPRESSOR HAVING REDUCED WEIGHT AS WELL AS EXCELLENT ANTI-SEIZURE AND WEAR RESISTANCE

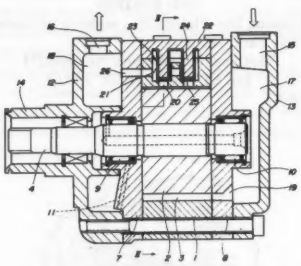
Nobuyuki Nakajima, Saitama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed May 15, 1989, Ser. No. 352,099

Int. Cl.[5] F04C *18/344, 29/00*

U.S. Cl. 418—178 5 Claims

1. In a vane compressor including a cylinder formed by a cylinder block, and front and rear side blocks closing opposite ends of said cylinder block, a rotor rotatably received within said cylinder, said rotor having vane slits formed in an outer peripheral surface thereof, and vanes slidably fitted respectively in said vane slits, the improvement wherein said cylinder block, front and rear side blocks, rotor and vanes are formed of an aluminum-based alloy, and inner end surfaces of the front and rear side blocks on which the rotor and vanes slide, and



outer surfaces of the vanes are each coated with Ni electroless composite plating layers having polytetrafluoroethylene (PTFE) dispersed therein.

5,024,592

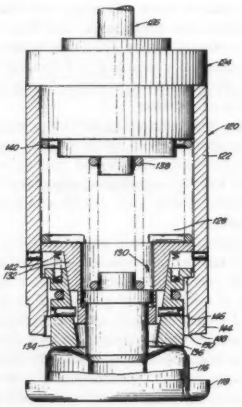
APPARATUS FOR FORMING AN AEROSOL CONTAINER CLOSURE

Robert H. Abplanalp, 10 Hewitt Ave., Bronxville, N.Y. 10708, and Virgil Naku, 264 Rutledge Ave., Hawthorne, N.Y. 10532

Continuation of Ser. No. 144,630, Jun. 11, 1988, abandoned, which is a continuation of Ser. No. 4,233, Dec. 31, 1986, abandoned, which is a continuation of Ser. No. 811,305, Dec. 16, 1985, abandoned, which is a continuation of Ser. No. 648,735, Nov. 19, 1984, abandoned, which is a division of Ser. No. 606,547, May 3, 1984, abandoned. This application Jun. 23, 1989, Ser. No. 371,685

Int. Cl.[5] B29C *51/12*

U.S. Cl. 425—112 17 Claims



1. An apparatus for a mass production of a gasket-bearing aerosol mounting cup having a panel, a skirt depending from the periphery of the panel and an annular channel extending outwardly from the skirt comprising

(a) means for disposing a band of gasket material onto the skirt of the mounting cup such that an end of the band distal from the channel of the mounting cup extends beyond the panel of the mounting cup,

(b) primary plunger means for advancing the band of gasket material onto the skirt of the mounting cup such that the

aforesaid distal end of the band is positioned at or below the periphery of the panel of the mounting cup,

(c) means for heating the band of gasket material, subsequent to the use of the primary plunger means,

(d) secondary plunger means having a retractable sleeve portion for advancing the heated band of gasket material to its ultimate position on the skirt and within the channel of the mounting cup, and for imparting a compressive deformation to the band of gasket material.

5,024,593

APPARATUS FOR TRANSPORTING MOLDINGS FROM AN INJECTION MOLDING MACHINE

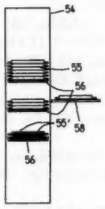
Karl Hehl, Arthur-Hehl-Str. 32, D-7298 Lossburg 1, Fed. Rep. of Germany

Filed Sep. 12, 1989, Ser. No. 406,265

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1988, 3830958

Int. Cl.[5] B29C *45/40*; B65G *60/00*

U.S. Cl. 425—556 **18 Claims**



1. An apparatus for transporting moldings made by injection molding in an injection molding machine, which apparatus comprises

a plurality of molding receptacles,

a filling station, which is adapted to hold each of said molding receptacles in a predetermined receiving position for receiving a complement of said moldings from said machine, and

transfer means for moving said molding receptacles from said filling station,

the improvement residing in that

said molding receptacles consist of stackable pallets,

said transfer means comprise a pallet tower having vertical skeleton members, an elevator, which is vertically movable in said tower along a predetermined path along said vertical skeleton members, and a plurality of vertically spaced apart handling pallets, which are supported by said elevator and each of which is adapted to carry a stack of said stackable pallets to form a load unit in which said stack is supported by said handling pallet, and

said elevator is adapted to contain at least one of said load units comprising empty ones of said stackable pallets and is adapted to hold one of said handling pallets in consecutive vertically spaced apart positions for consecutively receiving from said filling station a plurality of said stackable pallets when they have received a complement of moldings in said filling station.

5,024,594

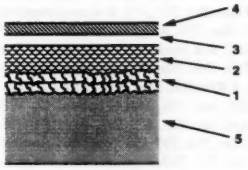
PROTECTIVE CLOTHING MATERIAL

Amulya L. Athayde, Mountain View, and Richard W. Baker, Palo Alto, both of Calif., assignors to Membrane Technology & Research, Inc., Menlo Park, Calif.

Continuation-in-part of Ser. No. 890,378, Jul. 23, 1986. This application Nov. 17, 1989, Ser. No. 438,527

Int. Cl.[5] B32B *7/00*

U.S. Cl. 428—246 **25 Claims**



1. A protective material, comprising a laminate of:

a fabric layer having a skin proximal side and a skin distal side;

a sorbent layer, comprising a mixture of a sorbent material in a polymeric binder material; and

a thin-film composite membrane layer, comprising a microporous support membrane coated with an ultrathin permselective membrane.

5,024,595

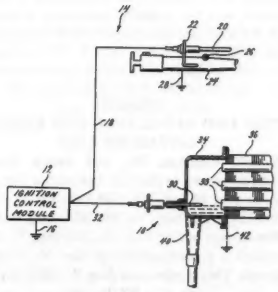
FURNACE PROTECTIVE DEVICE

David B. Schumacher, St. Louis, and Steven J. Bakowski, Richmond Heights, both of Mo., assignors to Snyder General Corporation, Red Bud, Ill.

Filed Jun. 5, 1989, Ser. No. 361,429

Int. Cl.[5] F23N *1/00*

U.S. Cl. 431—18 **4 Claims**



1. In a burner control for a condensing furnace, a first circuit adapted to sense the presence of a burner flame and a second circuit to shunt out said first circuit, the second circuit being responsive to the buildup of condensate within the condensing furnace in response to the operation of the first circuit and its rendering operative of the burner, the second circuit comprising a shunt circuit for the first circuit when the condensate buildup reaches a certain point in the condensing furnace, which shunt circuit can render the first circuit inoperative thereby to stop the burner operation,

the condensing furnace has an outlet manifold where condensate can collect, a drain opening from the manifold, and wherein the second circuit includes electrical contacts that are closed by the presence of a predetermined liquid level in the manifold due to clogging of the drain.

5,024,596

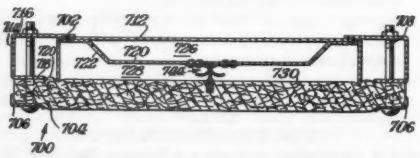
INFRA-RED EQUIPMENT

Thomas M. Smith, 1415 Golf Rd., Cinnaminson, N.J. 08077

Continuation-in-part of Ser. No. 752,908, Jul. 8, 1985, Pat. No. 4,604,054, Ser. No. 628,989, Jul. 9, 1984, Pat. No. 4,589,843, Ser. No. 592,793, Mar. 23, 1984, Pat. No. 4,654,000, Ser. No. 567,270, Dec. 30, 1983, abandoned, and Ser. No. 435,412, Oct. 20, 1982, abandoned, said Ser. No. 628,989, is a continuation-in-part of Ser. No. 509,161, Jun. 29, 1983, Pat. No. 4,500,283, said Ser. No. 592,793, is a continuation-in-part of Ser. No. 509,161, Ser. No. 312,730, Oct. 19, 1981, Pat. No. 4,443,185, and Ser. No. 292,167, Aug. 11, 1981, Pat. No. 4,474,552, said Ser. No. 567,270, is a continuation-in-part of Ser. No. 509,161, Ser. No. 312,730, and Ser. No. 292,167, said Ser. No. 435,412, is a continuation-in-part of Ser. No. 509,161, Ser. No. 312,730, Ser. No. 292,167, Ser. No. 279,081, Jun. 30, 1981, Pat. No. 4,416,618, Ser. No. 238,418, Feb. 26, 1981, Pat. No. 4,447,205, Ser. No. 186,491, Sep. 12, 1980, Pat. No. 4,378,207, and Ser. No. 178,121, Aug. 14, 1980, Pat. No. 4,373,904, said Ser. No. 509,161, is a continuation-in-part of Ser. No. 312,730, Ser. No. 292,167, Ser. No. 279,081, and Ser. No. 238,418, said Ser. No. 312,730, is a continuation-in-part of Ser. No. 292,167, Ser. No. 279,081, Ser. No. 234,418, Ser. No. 186,491. This application Sep. 3, 1985, Ser. No. 771,722

Int. Cl.[5] **F23D** *14/12*

U.S. Cl. 431—328 **3 Claims**



1. In an infra-red generator having a ceramic fiber mat directly covering a combustion mixture plenum from which a combustion mixture is passed through the thickness of the mat to emerge from a surface on which the mixture burns to heat to incandescence the fibers on that surface, the improvement according to which the mat has an intermediate portion adhered to a metal brace connected to the back of the plenum to support the mat, and the brace is essentially a metal sheet that extends into the mat and is adheres on both sides to the adjacent surfaces of the mat.

5,024,597

PROCESS AND APPARATUS FOR KOSHERING CONTAINER LIDS

Howard Skolnik, Chicago, Ill., and Jonah Gewirtz, Silver Spring, Md., assignors to Skolnik Industries Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 550,298, Jul. 9, 1990, which is a continuation-in-part of Ser. No. 348,803, Aug. 8, 1988, which is a continuation-in-part of Ser. No. 131,291, Dec. 8, 1987, Pat. No. 4,830,675, which is a continuation of Ser. No. 872,016, Jun. 9, 1986, abandoned. This application Aug. 8, 1990, Ser. No. 564,094

Int. Cl.[5] **F27B** *9/00*

U.S. Cl. 432—2 **16 Claims**

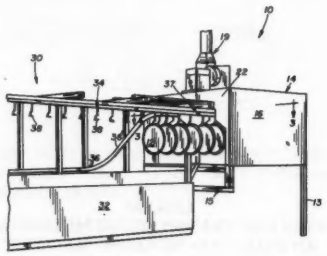
1. An apparatus for flame-treating metal lids of containers, drums, and the like, comprising:

a main housing comprising a rear wall, a pair of side walls, a top wall, and a front wall, said main housing having a substantially hollow interior through which may be conveyed lids to be flame-treated, said front wall having at least one entrance opening through which may pass the lids to be flame-treated;

a first flame means for producing flames, for flame-treating at least one surface face of a lid, mounted in said hollow interior;

a second flame means for producing flames, for flame-treating at least the other side surface of a lid, also mounted in said hollow interior;

conveyer means for conveying a series of lids to be flame-treated through said entrance of said front wall and into and out of said hollow interior of said main housing, said conveyer means comprising a first section for conveying lids into said hollow interior of said main housing, a second intermediate arcuate section for conveying the series of lids through said hollow interior, and a third section for conveying the series of lids out of said main housing after having been flame-treated by said first and second flame means;



said first flame means being mounted adjacent one of said pair of side walls, and said second flame means being mounted adjacent the other of said pair of flame means, each of said first and second flame means having a main directing portion through which exit the flames, each said main directing portion being directed toward said intermediate section of said conveyer means for directing the flames thereof toward the lids being transported thereby.

5,024,598

PROCESS AND DEVICE SUITABLE FOR THERMALLY PROCESSING A MATERIAL COMPRISING THERMALLY DEGRADABLE AND THERMALLY-RESISTANT SUBSTANCES

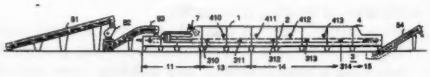
Franz Kettenbauer, Römerweg 16, D-7886 Murg/Baden, Fed. Rep. of Germany

Filed Dec. 16, 1988, Ser. No. 285,512

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1988, 3824615

Int. Cl.[5] **F27B** *9/28*

U.S. Cl. 432—59 **13 Claims**



1. A device for thermally processing a material containing thermally degradable or alterable and thermally resistant materials to provide a mineral substance essentially free of organic contaminants, comprising:

a closed furnace chamber internally encompassing at least a preheating zone and a baking zone;

endless sintering belt structure within said chamber passing through said zones;

a feed device for feeding unprocessed material into said furnace chamber and onto said belt structure;

said sintering belt structure transferring said material through said preheating zone for predrying said material in the presence of a reduced quantity of oxygen and thereinafter through said baking zone wherein said material is baked in the presence of an increased quantity of oxygen and an indirect hot gas supply;

a removal device for conveying processed material from said furnace chamber;

a waste gas line for conveying waste gas from said furnace chamber;

a plurality of bottom burners disposed below and along the length of said sintering belt structure;

and a plurality of top burners arranged above said sintering belt structure;

each said bottom burner comprising a combustion chamber and one or more burner nozzles;

each said bottom burner in said baking zone comprising at least two burner nozzles protruding from said combustion chamber, said bottom burner nozzles being directed at an acute angle to said sintering belt structure for indirectly heating said material from below said sintering belt structure so as to ensure that hot gases are not expelled from said bottom burner directly onto material on said sintering belt structure;

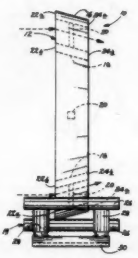
each said top burner being adapted to direct an additional stream of hot gases directly onto said material on the sintering belt structure in the baking zone and comprising a combustion chamber and a burner nozzle extending from said combustion chamber in orientation perpendicularly to said sintering belt structure, said top burner nozzles being located further from material on said sintering belt structure than said bottom burner nozzles supplying the hot gases from below said sintering belt structure.

5,024,599

SEMICONDUCTOR PROCESSING APPARATUS FOR CREATING BACK PRESSURE WITHIN A QUARTZ FURNACE TUBE

Navjot Chhabra, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed Apr. 24, 1990, Ser. No. 513,557
Int. Cl.[5] F24J *3/00*
U.S. Cl. 432—226 **9 Claims**



1. A semiconductor processing furnace flow restricting apparatus for insertion into a longitudinally elongated semiconductor wafer processing furnace to create back pressure and minimize streamlining flow of gas longitudinally along internal walls of the furnace to increase residence time of processing gases within the furnace, the apparatus comprising:

at least two ring-like members, one of the ring-like members being mounted inside the other, the ring-like members each having a fore longitudinal end and an aft longitudinal end, at least one of the ring-like members having a varying diameter which tapers inwardly between the fore longitudinal end and the aft longitudinal end to create back pressure and restrict gas flow longitudinally through the furnace; and

means for laterally supporting the two ring-like members within a longitudinally elongated semiconductor wafer processing furnace.

5,024,600

PERIODONTAL SCALER-LIKE MEDICINAL FLUID APPLICATOR

Joseph M. Kline, 3501 N. Valley St., Arlington, Va. 22207

Filed Jan. 26, 1990, Ser. No. 470,791
Int. Cl.[5] A61C *1/10*
U.S. Cl. 433—82 **22 Claims**

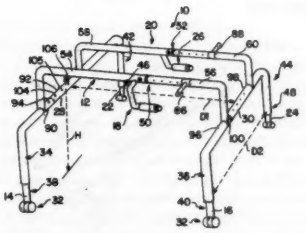
19. A periodontal implement for applying a medicinal fluid to the tissue in a patient's mouth adjacent teeth to be treated comprising, a handle having at least one blade extending therefrom, a shank for connecting said blade to said handle, a fluid passageway within said handle, said fluid passageway extending within said shank, an opening in said shank which communicates with said fluid passageway, said opening being oriented so as to discharge fluid to said blade, said blade having opposite edge portions, and a plurality of grooves formed in said edge portions of said blade.

5,024,601

SUPPORT DEVICE FOR SUPPORTING A SKATER

Henry E. Barker, 1741 Porter Ave., Beloit, Wis. 53511

Continuation-in-part of Ser. No. 368,282, Jun. 19, 1989, abandoned. This application Feb. 28, 1990, Ser. No. 486,149
Int. Cl.[5] G09B *19/00*
U.S. Cl. 434—255 **6 Claims**



1. A support device for supporting a skater, said device comprising:

a first extensible frame of inverted U-shaped configuration, said first frame having a first and a second end;

a first handle rigidly secured to said first frame between said first and second end for supporting the skater;

a second extensible frame of inverted U-shaped configuration, said second frame being spaced and parallel relative to said first frame, said second frame having a first and a second extremity;

a second handle rigidly secured to said second frame between said first and second extremities for supporting the skater such that in use of the device, the skater is disposed between the handles;

first and second laterally extensible supports extending between said first and second frames such that, in use of the device, the skater is disposed between said supports, the arrangement being such that adjustment of a first distance between said supports and a second distance between said frames is permitted so that the device provides adjustable support according to the size and skating ability of the skater;

caster means secured to said ends and said extremities for permitting the skater to develop balance and to practice skating techniques while the skater is supported by said handles;

said first handle including:

a hand grip disposed substantially horizontally;

a portion rigidly secured to said first frame and extending generally outwardly and then downwards relative to the skater such that said portion is disposed between said first frame and said hand grip;

said second handle including:

a further hand grip disposed substantially horizontally;

a further portion rigidly secured to said second frame and extending generally outwardly and then downwards relative to the skater such that said further portion is disposed between said second frame and said further hand grip, the arrangement being such that in use of the device, when the skater grips the respective handles, the wrists of the skater are braced and supported by said portion and further portion respectively so that the control and balance of the skater is enhanced;

said support device further including:

an auxiliary handle secured to said first frame and axially spaced relative to said first handle; and

a further auxiliary handle secured to said second frame and axially spaced relative to said second handle, the arrangement being such that in use of the device by a more experienced skater, the skater grips the respective auxiliary handles while said first and second handles support the upper arms of the skater.

5,024,602

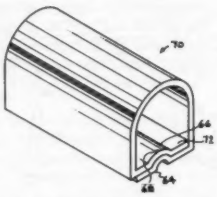
ELECTRICAL GROUNDING PRONG SOCKET

Robert Leong, Dublin, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation-in-part of Ser. No. 406,005, Sep. 12, 1989, abandoned. This application May 31, 1990, Ser. No. 531,437

Int. Cl.[5] H01R *13/11*

U.S. Cl. 439—107 **4 Claims**



1. A tubular socket for holding tubular and U-shaped grounding prongs, comprising:

a top wall of the tubular socket made of a conducting material;

a first side wall of the tubular socket made of a conducting material and joined to the top wall;

a second side wall of the tubular socket made of a conducting material and joined to the top wall;

a bottom wall of the tubular socket wherein a first side of the bottom wall is electrically connected to the first side wall and a second side of the bottom wall is electrically connected to the second side wall, said bottom wall further comprising a first foot point, wherein the first foot point is located a first vertical distance below the top wall and a first horizontal distance from the center of the top wall on a first side of the center of the top wall, a second foot point, wherein the second foot point is located a second vertical distance below the center of the top wall and a second horizontal distance from the center of the top wall on a second side of the center of the top wall, wherein the first vertical distance is substantially equal to the second vertical distance and the first horizontal distance is substantially equal to the second horizontal distance, and a first ridge with a first ridge top, wherein part of the ridge is horizontally located between the first and second foot points and the first ridge top is vertically located between the first foot point and the top wall, sot hat the vertical distance between the first ridge top and the top wall is less than the first vertical distance, and wherein the first side of the bottom wall overlaps with the second side of the bottom wall, wherein the ridge is formed where the first side of the bottom half overlaps with the second side of the bottom half so that the ridge is formed in both the first side of the bottom half and the second side of the bottom half.

5,024,603

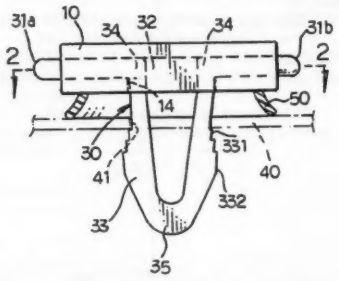
PROTECTION DEVICE FOR USE ON ELECTRICITY SOCKET

Shi-Nan Hsieh, P.O. Box 10780, Taipei, Taiwan

Filed Aug. 17, 1990, Ser. No. 568,896

Int. Cl.[5] H01R *13/44*

U.S. Cl. 439—148 **2 Claims**



1. A protection device for use on an electricity socket comprising:

a case which has two side holes provided at two opposite sides of said case, a third hole provided at a third side of the case, and a pair of holes provided at the bottom of said case for a plugging element to stick through;

a plugging element having a pair of elastic set legs extending downwardly through said pair of holes at the bottom of said case; said set legs each comprises a pair of bases extending horizontally to project out from said side holes of said case to serve as pressing ends, and each set leg has zigzag edge at its outward side to be stuck against the inside wall of a socket; meanwhile the width of said set legs is generally greater than the length of the socket holes;

a locking element provided in said case having at one end a pair of symmetric claws for keeping said locking element constantly in place and at the other end a pressing end projecting out through said third hole of said case; said locking element further comprises a neck, a first shoulder, a waist, and a second shoulder arranged orderly between said pressing end and said pair of claws wherein the

widths of said neck and said waist must be lesser than that of said shoulders;

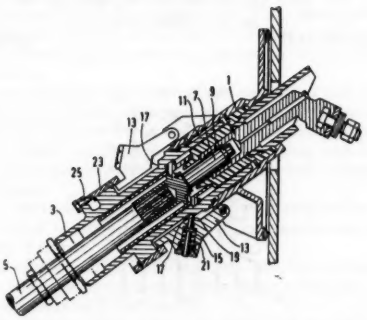
said base of each set leg not being connected directly so as to form a preparing area and extending downwardly by enlarging gradually to form a protrudent part which enables the width of said set leg at this part to be generally greater than the length of the socket holes; said first and second shoulders are generally kept in said preparing area so as to stop said set legs from being pressed to shorten its width easily.

5,024,604

NO-LOAD BREAKABLE ELECTRICAL CONTACT ESPECIALLY FOR CONNECTED APPLIANCES OR VEHICLES

Antoine Savin, Paris, and Jacques Salaun, Le Mans, both of France, assignors to Carrier Kheops Bac., Nanterre Cedex, France

Filed Nov. 22, 1989, Ser. No. 440,226
Claims priority, application France, Nov. 25, 1988, 88 15453
Int. Cl.[5] H01R *13/627*
U.S. Cl. 439—345 **4 Claims**



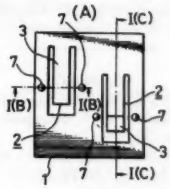
1. Electrical contact for electrically connecting at least two coupled appliances or vehicles; comprising a first electrical contact part and a second part located adjacent said electrical contact part and forming reversible mechanical junction means for the electrical contact, said mechanical junction means being configured so as not to affect the integrity of the electrical contact part during extraction or contact-breaking, said mechanical junction means including external engagement elements independently of the electrical contact part, said engagement elements including at least two articulated arms secured to the periphery of the electrical contact part diametrically opposite each other, said arms having spring pushers connected thereto for engaging elastically during the closing of the contact onto a retention profile on the body of a movable contact portion of said electrical contact part upon the arms being locked during operation and positioned along the body of a fixed contact portion of said electrical contact part, said spring pushers being calibrated to a specific force in order to allow the safety release of the said movable portion of the electrical contact part responsive to a specified separating force, whereby the junction is makeable manually under no voltage and breakable under no voltage in response to said separating force.

5,024,605

CONNECTING ELECTRODE

Yasushi Kasatani, and Toru Tachikawa, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jul. 13, 1990, Ser. No. 552,139
Claims priority, application Japan, Aug. 18, 1989, 1-213569
Int. Cl.[5] H01R *3/00*
U.S. Cl. 439—500 **3 Claims**



1. A connecting electrode comprising:

an electrode substrate;

a contact extending from said substrate having a button-hook-shaped section and a convex surface, said convex surface of said contact projecting from said electrode substrate for depression by a battery; and

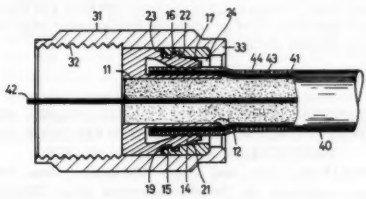
a projection limiting the amount of deformation of said contact by a battery, said projection projecting from the same side of the substrate as and beside said convex surface for engaging a battery urged against said battery contact.

5,024,606

COAXIAL CABLE CONNECTOR

Yeh Ming-Hwa, No. 2, Lane 8, Hsin An Rd., Shih Lin District, Taipei, Taiwan

Filed Nov. 28, 1989, Ser. No. 442,129
Int. Cl.[5] H01R *17/18*
U.S. Cl. 439—578 **5 Claims**



1. A coaxial cable connector, comprising:

a male clamping tube having a central hole and a rear projecting pipe, said male clamping tube having an inner diameter slightly larger than the outer diameter of an insulating portion of a concentric cable, and a rear clamping portion having several circularly arranged clamp sections extending rearward, the front ends of said clamp plates being formed with an annular groove so that said clamping section can be deformed and inwardly deflected; an annular projecting shoulder inwardly and rearwardly inclined, formed on said clamping sections, the rear ends of said clamp sections having an inwardly and rearwardly inclined face, the inner walls of said clamp plates being formed with a saw tooth portion;

a female clamping tube having a rearwardly tapered interior surface and an annular groove; and

a screw threaded tube housing having threads formed on an inner wall of the front end, said screw threaded tube housing receiving and enclosing said male and female clamping tubes, an inward extending flange being formed at rear end of said screw threaded tube, said flange having an inner diameter smaller than outer diameters of said

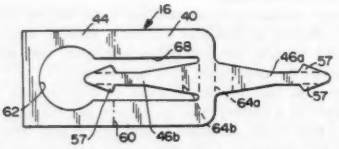
male and female clamping tube but larger than outer diameter of a coaxial cable, whereby when assembled, said screw thread tube and female clamping tube and male clamping tube are sequentially fitted over said coaxial cable with said insulating portion inserted into said projecting pipe and an axial wire of said coaxial cable protruding beyond front end of said male clamping tube, said female clamping tube engaging said clamping portion of said male clamping tube to press said clamping section until said annular projection engages said annular groove of said female clamping tube locking said male and female clamping tubes on said coaxial cable.

5,024,607

GROUNDING ELECTRICAL CONNECTOR

Jerry D. Kachlic, Clementi Park, Singapore, assignor to Molex Incorporated, Lisle, Ill.

Filed Jun. 14, 1990, Ser. No. 537,735
Int. Cl.[5] H01R *13/73*
U.S. Cl. 439—567 **11 Claims**



1. An electrical connector for mounting to a substrate such as a printed circuit board, comprising:

an insulating housing having a peripheral flange defining a front face;

a conductive shield positionable against the front face of the housing; and

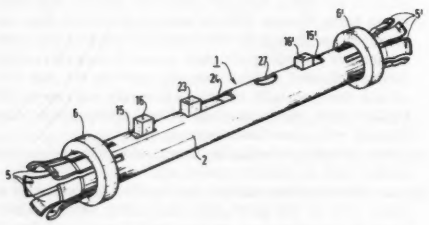
a conductive board lock member positionable on the housing for commoning the conductive shield to a ground trace on the printed circuit board, the board lock member including a body portion and a pair of legs positionable through a locking hole in the printed circuit board, one of the legs being bent form an edge of the body portion, and the other leg being bent out of an opening from another edge of said body portion defining said opening.

5,024,608

CONNECTION DEVICE FOR A COAXIAL CABLE AND A CORRESPONDING CONNECTION MODULE, IN PARTICULAR A JUNCTION BLOCK

Jean-Paul Heng, Lyons, and André Marmonier, Bron, both of France, assignors to Societe Anonyme dite: CEGELEC, Levallois-Perret, France

Filed Jan. 30, 1990, Ser. No. 472,542
Claims priority, application Japan, Jan. 30, 1989, 8901118
Int. Cl.[5] H01R *9/05*
U.S. Cl. 439—578 **9 Claims**



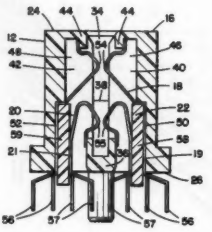
1. A connection device comprising at least one electrically conductive link tube (2) having at least one "connection" end arranged to receive one end of a coaxial cable (3) whose peripheral conductor (4) is stripped of its covering in order to be capable of being electrically connected to the tube into which it penetrates, said tube containing a conducting link part (10) on its axis, which part is fixed to the tube and is electrically insulated therefrom, and is shaped to be capable of axially receiving and holding the stripped end of the central conductor (9) of the cable, the said device being characterized in that it includes locking and electrical connection means for the peripheral conductor of a coaxial cable, said means being constituted by resilient peripheral tongues (5) provided at the connection end of the tube and alternating between being splayed apart and being close together depending on the position given to a first ring (6) sliding relative to the tube, and also includes looking and electrical connection means for the central conductor of the above-mentioned cable, said means being constituted by a connection head (12) of the clamping cone type provided with resiliently mounted jaws at the end of the link part, which jaws alternating between being splayed apart and being close together depending on the position given to a second ring (14) sliding on the link part, inside the tube, under the action of a pushbutton (16) projecting outside the tube through a longitudinal opening (15) therein.

5,024,609

HIGH-DENSITY BI-LEVEL CARD EDGE CONNECTOR AND METHOD OF MAKING THE SAME

Heinz Piorunneck, Trumbull, Conn., assignor to Burndy Corporation, Norwalk, Conn.

Filed Apr. 4, 1990, Ser. No. 504,762
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—637 **24 Claims**



1. An electrical connector for mechanically and electrically connecting a mother printed circuit board and a removable daughter printed circuit board of the edge card type, the connector comprising:

a first housing being comprised of an electrically insulating material and having a top surface with a slot for receiving a portion of a daughter printed circuit board and at least two rows of contact chambers on opposite sides of said slot;

a plurality of a first type of electrically conductive contacts positioned in at least some of said contact chambers, said first type of contacts having a relatively tall height in said contact chambers;

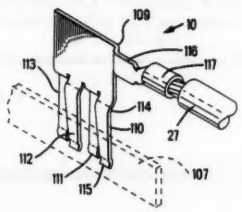
a plurality of a second type of electrically conductive contacts positioned in at least some of the same contact chambers as said first type of contacts, said second type of contacts having a relatively short height in said contact chambers and being spaced from said first type of contacts; and

a contact separator stationarily connected to said housing and located, at least partially, inside said contact chambers between portions of said first and second types of contacts located in said same contact chambers.

5,024,610
LOW PROFILE SPRING CONTACT WITH PROTECTIVE GUARD MEANS

Jay L. French, Middletown; John L. Himes, Jr., Hummelstown; Ronald M. Weber, Lebanon, and James H. Wise, Palmyra, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 16, 1989, Ser. No. 394,602
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—857 **7 Claims**



1. A contact for releasably engaging a conductor, combined with guard means for protecting said contact and said conductor against accidental touch by a human hand, said contact and said protective means comprising, in combination:

an elongated contact body of resilient conductive material;

a plurality of contact fingers formed integrally with said contact body, said fingers being spaced apart along an edge of said contact body and projecting in parallel from said edge of said body;

a first insulating housing,

said first housing enclosing said contact body with at least portions of each of said contact fingers extending through said first housing to the exterior thereof, said extending portions of said fingers being adapted to engage said conductor;

an insulating silo for enclosing said portions of said contact fingers extending to the exterior of said first housing,

said silo being formed in first and second sections,

one of said sections being positioned above said contact fingers and extending laterally across said plurality of fingers,

the other of said sections being positioned below said contact fingers and extending laterally across said plurality of fingers,

both of said sections extending longitudinally coextensively with said portions of said contact fingers extending to the exterior of said first housing,

both of said sections being corrugated in form and having channels open to the interior of said sections extending longitudinally over alternate ones of said contact fingers,

said channels of said second section extending over those alternate ones of said fingers which are interspersed between those alternate ones of said fingers which are covered by said channels of said first section,

the interior and exterior walls of said first and second sections extending substantially colinearly with one another so that the exterior surface of said silo is corrugated in form similar to the outline of the space enclosed by the interior walls of said first and second sections;

a second insulating housing,

said second housing enclosing said conductor to be engaged by said contact fingers;

an opening in said second housing aligned with said conductor enclosed by said second housing,

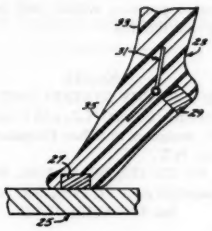
said opening having an outline which is complimentary to and congruent with the peripheral outline of the exterior of said silo so that said silo will fit closely within said opening,

whereby said silo and said portions of said contact fingers enclosed thereby may be inserted through said opening with said conductor extending between said first and second sections of said silo and being engaged by said contact fingers.

5,024,611
POSEABLE DOLL MAGNETICALLY SECURED TO ITS STAND

Douglas W. Eckerle, 1310 N. Daisy, Escondido, Calif. 92027, and Frank P. Sainburg, P.O. Box 11133, Bakersfield, Calif. 93389

Filed Jul. 14, 1989, Ser. No. 380,151
Int. Cl.[5] A63H *3/00, 33/26, 3/46*; A43B *13/14*
U.S. Cl. 446—268 **5 Claims**



1. Doll support apparatus comprising:

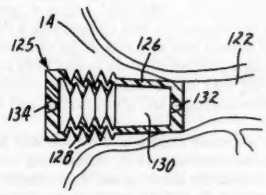
a ferromagnetic platform formed with an upwardly facing support surface;

a doll configured to stand in an erect position and including at least one leg including a foot device, including a foot portion having a heel section and forwardly projecting forefoot section, each section defining respective downward facing sole surfaces, said foot device including hinge means having sufficient flexibility to accommodate flexing of said foot portion between first and second positions, said foot device including magnetic inserts mounted in said forefoot and heel sections, respectively, and arranged to, when said hinge means is flexed to position said foot portion in said first position, dispose said forefoot magnetic insert in close proximity to said support surface to cooperate therewith to maintain said doll in an erect position and to, when said hinge mean is flexed to position said foot portion in said second position, dispose said heel magnetic insert in close proximity to said support surface to cooperate therewith to maintain said doll in an erect position.

5,024,612
EXTERNAL EAR CANAL PRESSURE REGULATING DEVICE AND TINNITUS SUPPRESSION DEVICE

Christopher van den Honert, Maplewood, and Paul H. Stypulkowski, North Oaks, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 286,744, Dec. 19, 1988. This application May 30, 1989, Ser. No. 359,025
Int. Cl.[5] A61F *11/00*
U.S. Cl. 604—36 **23 Claims**



1. A tinnitus suppression device adapted to be utilized in

conjunction with a person having an auditory system with an external ear canal, said tinnitus suppression device comprising:

a body, sized and shaped for insertion into said external ear canal of said person, said body having an orifice allowing for the communication of fluids in and out of said external ear canal;

sealing means coupled to said body for sealing said external ear canal from ambient; and

pressure means incorporated within said body and operably coupled to said orifice of said body for creating a selected negative pressure, with respect to ambient, to be chronically applied to said external ear canal with said device in place;

whereby said tinnitus suppression device creates said selected negative pressure within said external ear canal suppressing said tinnitus.

5,024,613

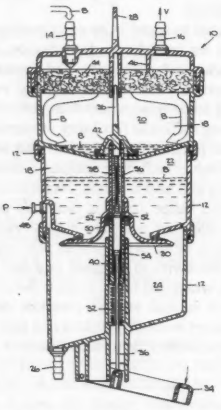
BLOOD RECOVERY SYSTEM AND METHOD

Alfred V. Vasconcellos, Edison, N.J., and Preston J. Keeler, III, Setauket, N.Y., assignors to Pfizer Hospital Products Group, Inc., New York, N.Y.

Division of Ser. No. 220,193, Jul. 18, 1988, Pat. No. 4,923,438. This application Apr. 27, 1990, Ser. No. 515,397

Int. Cl.[5] A61M *37/00*

U.S. Cl. 604—4 **16 Claims**



1. An autologous blood collection method comprising the steps of

a) establishing a connection between a patient and an inlet of a housing including a collection chamber having a plurality of compartments, said inlet being in fluid flow communication with said collection chamber;

b) providing fluid flow communication between a first of said compartments and a second of said compartments;

c) creating a first fluid seal between said second compartment and a third of said compartments;

d) establishing a negative pressure in said first and said second compartments, with said negative pressure being sufficient for conveying and maintaining a flow of blood from said patient into said collection chamber;

e) establishing a positive pressure in said third compartment;

f) introducing said blood into said first compartment for passage therethrough and collection in said second compartment;

g) creating a second fluid seal between said first and said second compartments while maintaining said first fluid seal and collecting blood in said first compartment;

h) releasing said first fluid seal and providing fluid flow communication between said second and said third compartments, passing into said third compartment blood collected in said second compartment; and

i) establishing a connection between said patient and an outlet in said collection chamber for conveying and reinfusing the blood into said patient.

5,024,614

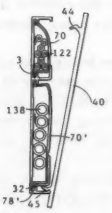
SURFACE ACCESSIBLE WIRING SYSTEM AND ASSEMBLY

Frank P. Dola; Steven Feldman; John H. Lauterbach, all of Hudson, and William G. Mengelson, Clearwater, all of Fla., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 249,539, Sep. 26, 1988, abandoned. This application May 16, 1989, Ser. No. 352,792

Int. Cl.[5] H01R *25/16*

U.S. Cl. 439—114 **33 Claims**



1. An enclosure comprising a channel of a given axial length having a transverse base with upstanding sides extending along said given length and terminated by lips directly inwardly parallel to said base, each lip including a rounded surface of a given radius, a further mating element adapted to be snap-fitted to said channel to form said enclosure, said mating element including an interior surface at each side thereof and there adjacent a pair of stiff projections, one for each side extending along the length thereof with each projection including a concave surface of a radius adapted to receive in mating engagement the said rounded surface of each lip, said further element being loaded in compression and said upstanding sides of said mating element being loaded in bending when the further element is mated with the upstanding sides of the transverse base, the length of said upstanding sides being substantially less than the height of said mating element so that the upstanding sides remain relatively inflexible, so that said further element is tightly secured to the base said further mating element being snap fittable between said upstanding sides by hand applied pressure and said further element being removable only upon the application of a force applied by a tool having a lever arm, wherein there is provided means allowing said further element to be positioned loosely attached to said channel at one side thereof permitting inspection of the interior of said channel prior to said further element being snapped into closing position on said enclosure.

5,024,615
SURGICAL ASPIRATION DEVICE

Udo P. Büchel, Billdal, Sweden, assignor to Astra Meditec Aktiebocag, Molndal, Sweden

PCT No. PCT/SE81/00341, § 371 Date Jul. 19, 1982, § 102(e) Date Jul. 19, 1982, PCT Pub. No. WO82/01824, PCT Pub. Date Jun. 10, 1982

Continuation of Ser. No. 185,244, Apr. 19, 1988, abandoned, which is a continuation of Ser. No. 943,847, Dec. 24, 1986, abandoned, which is a continuation of Ser. No. 649,971, Sep. 12, 1984, abandoned, which is a continuation of Ser. No. 403,642, Jul. 19, 1982, abandoned. This PCT application Nov. 24, 1981, Ser. No. 456,045

Claims priority, application Sweden, Dec. 4, 1980, 8008525

Int. Cl.[5] A61M *1/00*

U.S. Cl. 604—119 **4 Claims**

1. A surgical aspiration device comprising a tubular handle having a first end with an outlet for connection with a vacuum source and a second end, the second end being connected to a projecting point aspirator tube and supporting the aspirator tube for connection to the vacuum source, the aspirator tube being connected at a proximal terminus thereof to the handle and having a distal terminus open for point aspiration, an air supply tube extending along the aspirator tube, the air supply tube being in fluid communication with the aspirator tube through an interconnecting opening near the distal terminus of the aspirator tube, an inlet opening to atmosphere in the air supply tube near said handle, the air supply tube being imperforate throughout its extent except for the inlet opening so that ambient air can enter it only through the inlet opening, said inlet opening in the air supply tube being located to facilitate hand control and stoppage of the flow of air therethrough by a finger of the user during use of the aspirator device, whereby aspiration at a point is controlled by the user variably and selectively opening and closing the inlet opening to vary and stop selectively the air flow through the air supply tube to the aspirator tube via the interconnecting opening and thereby controllably vary the vacuum at the open distal terminus of the aspirator tube where point aspiration occurs.

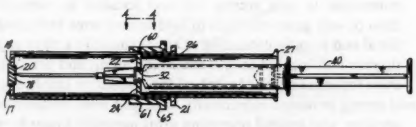
5,024,616
DISPOSABLE SHEATH FOR HYPODERMIC CANNULA USED WITH A SYRINGE

George Braddock Ogle, II, Alta Loma, Calif., assignor to International Medication Systems, Limited, South El Monte, Calif.

Filed Nov. 15, 1988, Ser. No. 271,749

Int. Cl.[5] A61M *5/32*

U.S. Cl. 604—192 **14 Claims**



1. A protective device for a removable cannula used with a hypodermic syringe, the device comprising:

an elongated sheath open at a first end and having a longitudinally extending slot;

a hypodermic syringe barrel disposed within the sheath and having a plunger with a first end extending from a first end of the barrel and from the open end of the sheath;

a fitting at a second end of the barrel, the barrel fitting having an opening extending through it to communicate with the barrel interior;

an elongated hypodermic cannula having a longitudinal opening extending through it;

a fitting on the cannula, the fitting being constructed and arranged to mate with the barrel fitting and hold the cannula so the cannula opening communicates with the barrel interior through the opening in the barrel fitting;

a piston having a central opening and disposed in the sheath to be sandwiched between the two fittings and to be longitudinally slidable with the barrel, fittings, and cannula relative to the sheath between an extended position and a retracted position, the sheath being sufficiently long so that, when the piston is in the retracted position, the scarf end of the cannula is safely enclosed within the sheath; and

a pin secured to the piston and extending laterally into the slot.

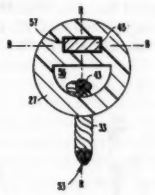
5,024,617
SPHINCTEROTOMY METHOD AND DEVICE HAVING CONTROLLED BENDING AND ORIENTATION

John Karpiel, Winston-Salem, N.C., assignor to Wilson-Cook Medical, Inc., Winston-Salem, N.C.

Filed Mar. 3, 1989, Ser. No. 318,724

Int. Cl.[5] A61B *17/36*

U.S. Cl. 606—47 **13 Claims**



1. A medical sphincterotome, comprising:

an elongated multi-lumen tubular member having a proximal end and a distal end and being sized to be received in an endoscopic lumen;

a cutter having a cutting edge located along said distal end of said tubular member and oriented generally longitudinally with respect to said tubular member, wherein said cutting edge is movable in a cutting plane to cut a patient's sphincter, said cutter being connected to a conductor disposed in a first longitudinal lumen in said tubular member;

a second longitudinal lumen along the length of said tubular member for receiving reinforcing means; and

reinforcing means disposed in said second longitudinal lumen for resisting movement of said cutting edge out of said cutting plane, said reinforcing means having a first cross-sectional moment of inertia with respect to a bending axis normal to said cutting plane, said reinforcing means further having a second cross-sectional moment of inertia with respect to a resisting axis lying along said cutting plane and generally perpendicular to said tubular member, wherein said second moment of inertia is greater than said first moment of inertia along said distal end to resist bending out of said cutting plane to provided controlled cutting of the patient's sphincter along said cutting plane.

5,024,618

EXTERNAL FIXATION DEVICE

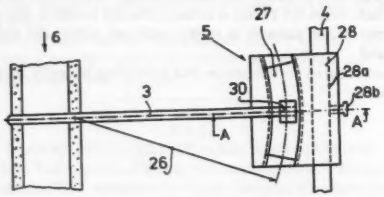
Slobodan Tepic, Davos, Switzerland, assignor to Synthes U.S.A., Paoli, Pa.

Continuation of Ser. No. 184,802, Apr. 22, 1988, abandoned. This application Jan. 18, 1990, Ser. No. 465,575

Claims priority, application PCT Int'l Appl. Apr. 30, 1987, PCT/EP87/00235

Int. Cl.[5] A61F 5/04

U.S. Cl. 606—53 16 Claims



1. A clamp for connecting a support rod to a bone pin in the external fixation of fractured bones, said clamp comprising a first section, means for fixing said first section to a support rod, a second section, connecting means for connecting said second section to said first section, a single bone pin having a longitudinal axis, said bone pin being positioned in said second section, said connecting means constraining movement of said second section relative to said first section to an arcuate path which is symmetrical relative to said first section.

5,024,619

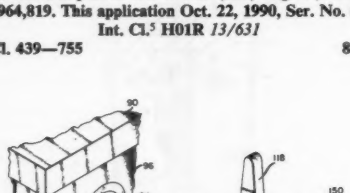
TERMINAL CONNECTOR ASSEMBLY

Damian F. Caraballo, 1250 Chorus Way, Royal Palm Beach, Fla. 33411

Continuation-in-part of Ser. No. 394,128, Aug. 15, 1989, Pat. No. 4,964,819. This application Oct. 22, 1990, Ser. No. 601,446

Int. Cl.[5] H01R 13/631

U.S. Cl. 439—755 8 Claims



1. A tool-free assembly for connecting battery cable terminals to batteries having side post terminals with female fittings, comprising:

a male connector member adapted for engagement to said female battery terminal fitting;

a lever member having substantially at one end thereof an aperture dimensioned to permit the passage of a portion of said male connector member, said lever member having a first inclined surface;

a battery cable terminal having an aperture dimensioned to permit the passage of a portion of said male connector member, and having a second inclined surface;

said male connector member being positionable through said apertures of said lever member and said battery cable terminal, and connectable to said female fitting of said battery terminal, to secure said battery cable terminal and said lever member in an abutting relation adjacent to said battery terminal with said inclined surfaces being substantially juxtaposed and angularly offset from one another, whereby rotation of said lever member relative to said battery cable terminal will cause sliding contact between said inclined surfaces and will move said battery cable terminal against said battery terminal.

5,024,620

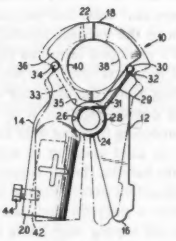
BATTERY TERMINAL POST CLAMP

Joseph Bell, 52 Pluto Cir., N. Fort Myers, Fla. 33903

Filed Jun. 11, 1990, Ser. No. 535,597

Int. Cl.[5] H01R 4/48

U.S. Cl. 439—759 3 Claims



1. A battery cable connector comprising:

first and second arcuate jaws each comprising a periphery, first and second side faces, a first recess extending between said first and second side faces facing the like first recess to form a generally cylindrical first bore for receiving a battery terminal post, a second recess spaced from said first recess and each extending between said first and second side faces and facing the like second recess to form a generally cylindrical second bore, a third recess in said periphery extending between said first and second side faces, and a groove in said first side face extending from said second recess to said third recess;

a pair of operating arms, each of said operating arms connected to a respective arcuate jaw, said operating arms extending divergently from said first and second arcuate jaws;

a spring including a spring coil mounted in said second cylindrical bore and a pair of spaced apart spring arms connected to said spring coil and located in respective ones of said grooves, each of said spring arms including a distal end portion extending at approximately a right angle thereto and located in and extending along and providing even forces along the length of the respective third recess;

said spring mounted to normally urge said jaws towards one another, and second operating arms movable towards one another against the force of said spring to open said jaws;

connection means on one of said operating arms for connecting a battery cable thereto; and

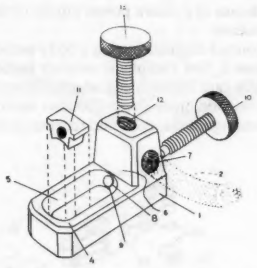
alignment aiding means including a first distal end on said first arcuate jaw, a second distal end on said second arcuate jaw, a tapered projection extending from said first distal end towards said second distal end, and recess means defining a tapered recess in said second distal end receiving and maintaining said tapered projection therein to aid in maintaining alignment of said jaws.

5,024,621

SINGLE BLOCK FOR FIXING ELECTROCONDUCTOR CABLES TO VEHICLE BATTERY TERMINALS

Francisco R. E. Mata, Avenida "F" con Avenida "D", El Pinar El Paraiso, Caracas, Venezuela

Filed Mar. 1, 1990, Ser. No. 486,762
Int. Cl.[5] H01R 4/30
U.S. Cl. 439—771 2 Claims



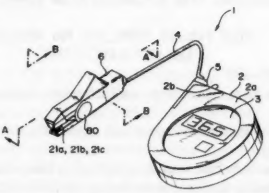
1. A single block piece for fixing electroconductor cables to vehicle battery terminals, comprising: an essentially hollow configuration formed in said single piece, said hollow configuration forming an essentially ellipsoidal shape for receiving a battery terminal; a front end portion of said single block piece extending upwardly defining an expanded region having a substantially hollow cross-section, said front end portion of said single block piece having a lower region defining a first hole with an inner threaded surface; a screw threadably inserted into said first hole; a circular plate positioned in said hollow region for sliding in said hollow region, said circular plate being fixable to said screw, movement of said screw in a direction toward said hollow region acting to urge said circular plate into engagement with a battery terminal, said expanded region having an upper end with a second threaded hole; a screw threadably positioned in said second threaded hole, said screw acting to exert pressure on a cable positioned in the hollow region of said expanded portion of said front end of said single piece.

5,024,622

DETACHABLE PROBE-TYPE ELECTRONIC CLINICAL THERMOMETER

Tetsuya Ide, Fuji, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 6, 1989, Ser. No. 362,022
Claims priority, application Japan, Jun. 9, 1988, 63-140519
Int. Cl.[5] H01R 7/06
U.S. Cl. 439—829 6 Claims



1. A detachable probe-type electronic clinical thermometer comprising:

a temperature measuring probe equipped with at least a first connector; and

a clinical thermometer main body equipped with a cord to a distal end of which is attached a second, clip-type connector adapted for being connected with said first connector;

said first and second connectors each having a plurality of corresponding electrical contacts;

said plurality of electrical contacts of said second connector each comprising a spring body through which passes an electrical signal from said probe;

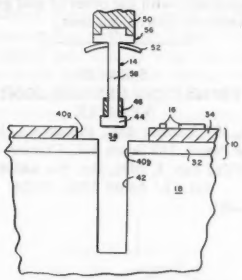
each of said plurality of spring bodies independently and directly engaging, due to a spring urging force thereof, the corresponding electrical contact of said first connector when the plurality of contacts of said first and second connectors are electrically connected to each other.

5,024,623

ELECTRICAL CIRCUIT BOARD MOUNTING METHOD

Ralph E. Bauman, Lancaster, and Horace W. Seymour, III, Landisville, both of Pa., assignors to Sanders Associates, Inc., Nashua, N.H.

Division of Ser. No. 391,681, Aug. 11, 1989, which is a continuation of Ser. No. 16,145, Feb. 18, 1987, abandoned. This application Jun. 27, 1990, Ser. No. 544,860
Int. Cl.[5] H01R 4/02
U.S. Cl. 439—876 4 Claims



1. An electrical circuit board assembly comprising:

A. an electrical circuit board having a mounting hole extending therethrough;

B. an electrical housing having a mounting bore therein; and

C. a pin having a pin shaft extending through said mounting hole into said mounting bore and secured by solidified solder in said mounting bore, said pin having a pin head and a leaf washer, said pin head having a greater diameter than said pin shaft, said leaf washer disposed between said pin head and said electrical circuit board and engaging the surface of the electrical circuit board to secure said electrical circuit board to said electrical housing.

5,024,624

Patent Not Issued For This Number

5,024,625

TOP AND PROPELLING ELEMENT

Patrick MacCarthy, 5263 Arbutus St., Arvada, Colo. 80002

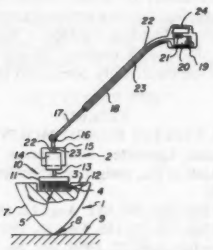
Filed Aug. 9, 1988, Ser. No. 230,090
Int. Cl.[5] A63H 1/02
U.S. Cl. 446—259 14 Claims

1. A toy spinning top system, comprising:

a spinning top having a first gripping section on an upper portion thereof; and

a movable impelling means for imparting rotational motion to said spinning top when said spinning top is at rest and when said spinning top is rotating without substantially interrupting the rotation of the spinning top, and for imparting translational motion to said top along a surface on which the top is spinning, wherein said impelling means includes a rotatable second gripping section cooperatively engageable with said first gripping section of said spinning top, such that said cooperative engagement between said gripping sections causes rotating motion and translational motion to be transmitted from said impelling means to said spinning top in response to rotation and movement of said

impelling means, said impelling means having a drive means for rotating said second gripping section,



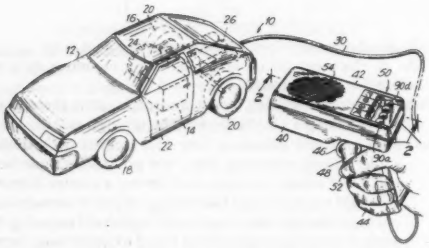
wherein one of said first and second gripping sections has a brush-like member having a plurality of bristles cooperatively engageable with the other of said gripping sections in a substantially co-axial manner.

5,024,626

SOUND PRODUCING REMOTE CONTROL TOY VEHICLE

Jack Robbins, 197 Summit Ave., Pompton Lakes, N.J. 07442, and Dietmar Nagel, 147 South Rd., Chester, N.J. 07930

Filed Feb. 1, 1991, Ser. No. 649,407
Int. Cl.[5] A63H *5/00, 17/34*
U.S. Cl. 446—409 **20 Claims**



1. A remote control toy vehicle system comprising a toy vehicle including motor means for selectively driving said toy vehicle, a remote control electrically coupled to said toy vehicle but remote therefrom including manually actuatable first control means for controlling said motor means, said remote control further including sound producing means for selectively producing sounds related to said toy vehicle and manually actuatable second control means for controlling the sounds producible by said sound producing means.

5,024,627

FLOAT MOUNTED RECEPTACLE CONTACT ASSEMBLY FOR CARD CAGE

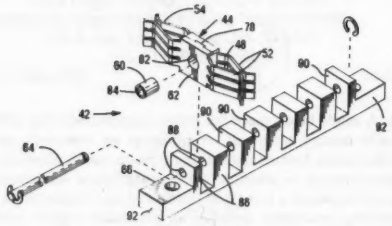
Glenn E. Bennett; John E. Lucius; Roger N. Polk; Frederick H. Rider, and David S. Szczesny, all of Glendale, Ariz., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 29, 1990, Ser. No. 546,620
Int. Cl.[5] H01R *23/70*
U.S. Cl. 439—631 **10 Claims**

1. A contact assembly for use in a card cage to interconnect a power bussing system of the card cage with respective daughter cards inserted into said card cage at respective card locations to become electrically connected with circuit means of a backplane of the card cage, each daughter card including corresponding power bussing means along at least one of an upper and lower edge thereof defining source and return paths associated with source and return circuits of said cage power bussing system, and each source and return path of the card power bussing means including a blade-shaped contact section extending rearwardly from the card, comprising:

a plurality of contact members mounted to a clevis block mountable to framework of the card cage, said contact members being associated in pairs and insulated from each other, one said contact member of each pair being associated with a corresponding contact means of a source power circuit of the cage power bussing means and the other thereof being associated with a corresponding contact means of a return power circuit of the cage power bussing means;

each said contact member having a body section and including at least a first receptacle contact section facing forwardly at a card location and adapted to receive thereinto a respective said blade-shaped contact section of said card power bussing means, each said receptacle contact section



defined by an array of paired opposed spring arms extending forwardly from said body section and having substantial stiffness to generate substantial contact normal force on side surfaces of a said blade-shaped contact section upon mating wherein said spring arms are deflectable apart thereby;

said body section of each said contact member is mounted between adjacent salients of said clevis block and having a width less than the distance between said adjacent salients whereby incremental lateral movement of said body section is permitted between said salients; and

each said body section includes a transverse aperture aligned with shaft-receiving apertures through said salients, and a shaft is inserted through all said aligned apertures in a manner adapted to permit rotatable motion of said contact members about said shaft and securing said contact members to said clevis block electrically isolated between respective pairs of said adjacent salients.

5,024,628

MATERNITY AND NURSING BRASSIERE WITH STRAP VARIATIONS

Mary M. Sanchez, 5246 S. Camino de la Tierra, Tucson, Ariz. 85746

Filed Feb. 20, 1990, Ser. No. 482,213
Int. Cl.[5] A41C *3/04*
U.S. Cl. 450—36 **9 Claims**

1. A brassiere apparatus, said brassiere apparatus comprising:

a pair of detachable breast cup means for facilitating breast feeding,

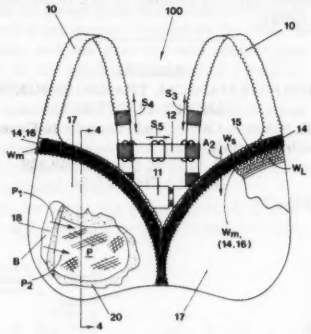
each of said breast cup means having breast size compensation means for accommodating variable breast sizes experienced by a wearer during a breast feeding phase,

said breast size compensation means comprising a first detachable closure member located on an upper perimeter portion of said breast cup means and a second mating closure member located on an upper brassiere support band,

said first closure member being controllably and detachably attached to selectable width portions on said second closure member to effect breast size fitting compensation

such that said breast cup means comfortably conforms to said variable breast sizes;

a encircling band for securing said brassiere apparatus to a backside of a wearer, said encircling band having a plurality of horizontally spaced attachment points; and



a pair of shoulder straps attached at one end to said upper brassiere support band and detachably attached at other end to said encircling band at selected ones of said horizontal attachment points to effect controllable strap width setting, each of said shoulder straps having a plurality of corresponding vertically spaced attachment points located proximate said other end.

5,024,629

COIN HOLDER/DISPENSER

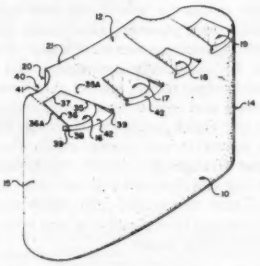
Darlene G. Murray, 1043 Wascana St., Regina, Saskatchewan, Canada S4T 4H8

Filed Oct. 23, 1989, Ser. No. 425,223

Claims priority, application Canada, Jan. 10, 1989, 587833

Int. Cl.[5] G07D *1/00*

U.S. Cl. 453—54 **1 Claim**



1. A device for holding and dispensing coins comprising a molded plastics body having an upper surface, a lower surface, a front surface and a rear surface and defining a plurality of cylindrical bores through the body in parallel spaced relation along the body with each bore having upper and lower ends breaking out on the upper and a lower surfaces respectively of the body, each bore having a cross section which is constant along at least the majority of its length and arranged to receive and closely surround a particular denomination of coin, the bores being arranged side-by-side across a width of the body so that the body includes a front surface of the body and a rear surface of the body lying generally parallel to each other, a plurality of plug members each arranged to cooperate with a respective one of the bores and with the lower surface of the body to extend into and to removably plug a lower end of the bore, and a plurality of spring means each arranged in a respective one of the bores in engagement with the respective plug member so as to bias upwardly toward the upper surface any coins within the bore, the upper surface being molded to define for each bore breaking out thereon a pair of side shoulder means for engaging an uppermost one of the coins in the bore so as to prevent axial movement of said uppermost coin out of the upper end of the bore, the front surface of the body at said upper surface being free from said shoulder means such that the uppermost coin can be slid forwardly from the bore under said side shoulder means in a direction at right angles to the axis of the bore to be released from the bore for dispensing, the side shoulder means extending across the upper surface to a front edge of the side shoulder means at the front surface, the upper surface being shaped to define for each bore a channel extending thereacross from a position at the rear surface and rearward of the bore to a position at the front surface and forward of the bore, side edges of the channel being defined by innermost side edges of the side shoulder means such that the channel intersects with an exposed portion of the uppermost coin, the channel increasing in depth from a rear surface toward the front surface so that the finger of the user is guided along the channel into contact with the coin, the channel increasing in width from the rear surface toward the front surface, the rear surface including a vertical flange member rearwardly of the rear surface and spaced therefrom such that the flange member can be attached over a belt of a user.

5,024,630

HARVESTER THRESHER

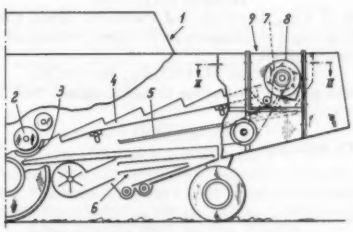
Horst Harig, Marienfeld, and Hermann Kersting, Oelde/Lette, both of Fed. Rep. of Germany, assignors to CLAAS OHG, Harsewinkel, Fed. Rep. of Germany

Filed May 29, 1990, Ser. No. 530,737

Claims priority, application Fed. Rep. of Germany, May 31, 1989, 3917605

Int. Cl.[5] A01F *7/00, 12/18;* A01D *41/12*

U.S. Cl. 460—21 **13 Claims**



1. A harvester thresher, including a chassis; a housing; a threshing unit operating in accordance with the principle of a tangential flow; straw shaking means; and a threshing and separating unit located after said straw shaking means in said housing and operating in accordance with the principle of an axial flow so that said straw shaking means is located between said units, said threshing and separating unit being formed as a separate unit; means in said housing for supporting said separate unit exchangeably so that it can be exchanged by another structural unit.

5,024,631

COMBINE HARVESTER

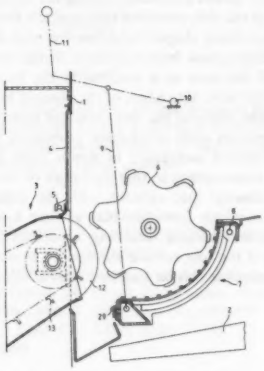
Franz Heidjann, Harsewinkel, and Karl-Josef Kleingraeber, Muenster, both of Fed. Rep. of Germany, assignors to Claas OHG, Harsewinkel, Fed. Rep. of Germany

Filed Apr. 23, 1990, Ser. No. 513,487

Claims priority, application Fed. Rep. of Germany, May 6, 1989, 3914962

Int. Cl.[5] A01F *12/26, 12/28*

U.S. Cl. 460—75 7 Claims



1. A combine harvester having a threshing unit housing, a tangential-flow threshing unit installed transversely to the direction of travel and comprising a drum and a concave, an inclined conveyor entering the threshing unit housing and an inspection flap arranged in the front wall of the threshing unit housing above the inclined conveyor, the concave surrounding the drum over an arc having a sieve lining and a frame supporting the latter and comprising two longitudinal strips and two arcuate end strips, wherein the sieve lining is divided into a plurality of longitudinally abutting lining sections (25, 26, 27) having respective butt joints and which are supported at the butt joints by arcuate webs (18) of the frame (14) and are designed so as to be removable from the frame (14) in the circumferential direction and are accessible and removable through the opened inspection flap (4).

5,024,632

TRANSMISSION SHAFT WITH SHEAR SECTION AND DEBRIS RETAINER

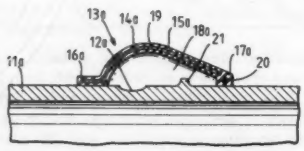
Vernon F. Cox, Somerton, and Phillip M. Hyde, Crewkerne, both of England, assignors to Westland Helicopters Limited, Yeovil, England

Filed Nov. 14, 1989, Ser. No. 435,715

Claims priority, application United Kingdom, Nov. 21, 1988, 8827169

Int. Cl.[5] F16D *9/00*

U.S. Cl. 464—33 9 Claims



1. A transmission shaft for transmitting rotary movement includes a shear neck portion comprising a circumferential recess in the external surface of the shaft to attract a failure in the event of overload of the shaft and debris retention means comprising an annular retainer having one end portion rotationally fixed to the external surface of the shaft at one side of the shear neck portion and the other end portion of said annular retainer slidingly engaged with the surface of the shaft at the other side of the shear neck portion, said annular retainer having an internally concave shape between said end portions so as to define with the external surface of the shaft a debris retaining cavity.

5,024,633

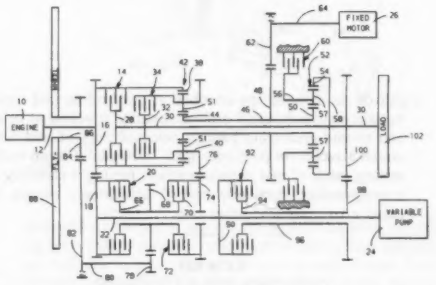
HYDROMECHANICAL TRANSMISSION WITH ADJUNCT FLYWHEEL

Michael R. Schmidt, Carmel, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 9, 1990, Ser. No. 549,839

Int. Cl.[5] F16H *47/04*

U.S. Cl. 475—72 2 Claims



1. A hydromechanical transmission comprising: engine input means; flywheel input means; hydrostatic transmission means having a pump means and motor means; first planetary gear means having a first member drivingly connected with said engine input means, a second member connected with said motor means and a third member; second planetary gear means having a first member connected with said output means, a second member connected with said motor means and a third member; brake means for selectively restraining said third member of said second planetary gear means; means drivingly connecting said engine input means with said pump means; first clutch means for selectively connecting said engine input means with said output means; second clutch means for selectively connecting said engine input means with said flywheel input means; third clutch means for selectively connecting said engine input means to said output means through a speed increasing gear arrangement; fourth clutch means for selectively connecting said flywheel with said third member of said first planetary gear means; and fifth clutch means for selectively connecting said third member of said first planetary gear means with said output means.

5,024,634

HYDRAULIC VARIABLE LOCK DIFFERENTIAL WITH OIL RETURN IN FLOATING MANIFOLD

Martin G. Blessing, Fort Wayne, Ind., assignor to Dana Corporation, Toledo, Ohio

Continuation of Ser. No. 241,596, Sep. 8, 1988, abandoned. This application Apr. 23, 1990, Ser. No. 515,644

Int. Cl.[5] F16H *1/44*

U.S. Cl. 475—86 8 Claims

1. A variable lock vehicle differential apparatus for driving a pair of vehicle half axles from a drive shaft, comprising:

an outer housing;

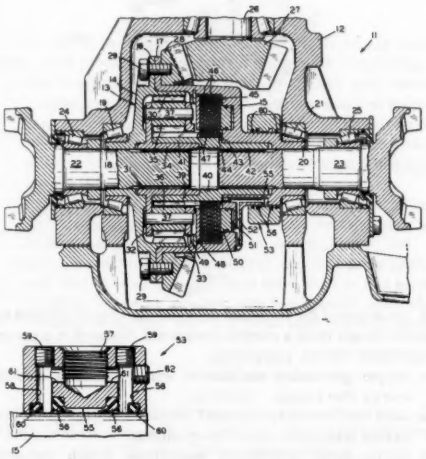
a differential gear assembly in a case rotatably mounted in said housing and adapted to be coupled between a vehicle drive shaft and a pair of vehicle half axles, said differential

gear assembly including a sun gear coupled to one of said half axles and an annular gear attached to said case and coupled to a planetary gear assembly mounted in said case and having a first plurality of planet gears each coupled for rotation by said case, a second plurality of planet gears each coupled for rotation by an associated one of said first plurality of planet gears and coupled to rotate said sun gear, and a hub portion coupled to the other one of said half axles, said sun gear and said annular gear rotating relative to one another during relative rotation between said half axles;

a clutch assembly coupled between said case and said sun gear for selectively resisting relative rotation between said case and said sun gear upon actuation;

actuating means for selectively hydraulically actuating said clutch assembly; and

a manifold for supplying hydraulic fluid to said actuating means, said manifold mounted inside said outer housing



and having an annular body for rotatably accepting said case, said manifold adapted to be connected to a source of hydraulic fluid under pressure, said manifold having an inwardly facing annular channel formed therein and an inlet formed in said annular body and in fluid communication with said channel, said channel being in fluid communication with said actuating means, a pair of lip seals positioned on opposite sides of said channel and sealingly engaging an outer surface of said case to function as a primary seal, a pair of O-ring seals retained in grooves formed in said annular body and positioned outwardly of said lip seals to function as a secondary seal sealingly engaging said outer surface of said case and an outlet formed in said annular body and in fluid communication with an inwardly facing surface of said manifold positioned between said lip seals and said O-ring seals whereby fluid in said channel which leaks past said lip seals flows to said outlet.

5,024,635

RELATING TO RAM UNITS IN TRANSMISSIONS OF THE TOROIDAL RACE, ROLLING TRACTION TYPE

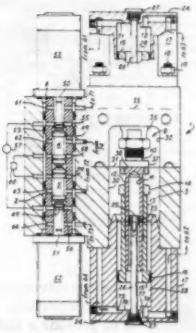
Leslie K. Robinson, 16 Cedarwood Drive, Leyland Preston, Lancashire PR5 1HN, England

Filed Aug. 4, 1989, Ser. No. 389,485

Claims priority, application United Kingdom, Aug. 4, 1988, 8818518

Int. Cl.[5] F16H *15/36;* **F15B** *15/22*

U.S. Cl. 475—115 **14 Claims**



1. In or for a transmission of the toroidal-race, rolling-traction type:

A hydraulic ram comprising a cylinder, and a piston movable within that cylinder so that the piston and cylinder define between them a working space of variable volume, the space being bounded at one axial end by the piston and at the other by an axial end wall of the cylinder;

means to connect the piston to at least one roller of the transmission, whereby the angular orientation of the roller is related to the axial position of the piston within the cylinder;

inlet and outlet ports to the working space, the inlet port being connectable in use to a source of hydraulic fluid under pressure and the outlet port to exhaust; in which the inlet and outlet ports are both formed in the axial end wall of the cylinder, and in which:

the axial end wall of the cylinder provides a stepped boundary for the working space;

the outlet port is located on the step but the inlet port is located below it, and the outlet port lies axially protruding of the inlet port, whereby as the piston approaches the end wall it tends firstly to increase the flow resistance of the outlet port and secondly to contact it and so be prevented from further axial movement, without substantially obstructing the inlet port.

5,024,636

PLANETARY WHEEL HUB

Dan E. Phebus, Rossville; William A. Schrader, Lafayette, and Russell E. Summers, Jr., West Lafayette, all of Ind., assignors to Fairfield Manufacturing Company, Inc., Lafayette, Ind.

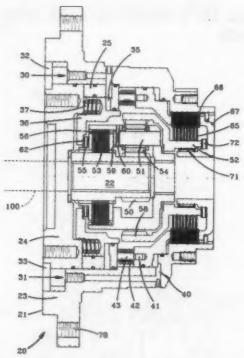
Filed Jun. 27, 1989, Ser. No. 372,020

Int. Cl.[5] F16H *57/10*

U.S. Cl. 475—141 **33 Claims**

1. A planetary transmission comprising a sun gear, means to rotate said sun gear, planet gears, said planet gears surrounding said sun gear, a planet carrier, means to connect said planet gears to said planet carrier, means to connect said planet carrier to an output for the transmission, a first clutch pack, a first set of springs, said first set of springs activating said first clutch pack to connect said planet carrier to said sun gear for rotation therewith, a first means to override said first set of springs to disconnect said planet carrier from said sun gear, a stationary

housing, a ring gear, said ring gear surrounding said planet gears, a second clutch pack, a second set of springs, said second set of springs activating said second clutch pack to connect said ring gear to said stationary housing to prevent the rotation of said ring gear, a second means to override said second set of springs to disconnect said ring gear from said stationary hous-



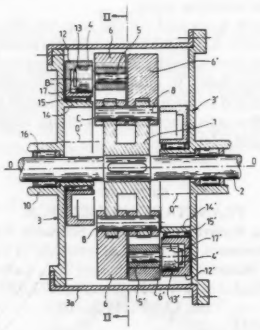
ing and operation means to selectively operate said first and second means so as to alter the operative condition of the planetary transmission so as to provide a first drive condition with operation of said first means, a second drive condition with operation of said second means and a braking condition with both said first and second clutch packs activated.

5,024,637

AUTOMATIC MECHANICAL TRANSMISSION APPARATUS WITH CONTINUOUS VARIATION OF THE TRANSMISSION RATIO FROM AN INFINITE RATIO UP TO A RATIO LESS THEN 1/1

Louis Guichard, 10, Impasse Henry Bouchard, 21000 Dijon, France

Filed May 21, 1990, Ser. No. 525,919
Claims priority, application France, May 24, 1989, 89 06804
Int. Cl.[5] F16H *3/70*
U.S. Cl. 475—166 **10 Claims**



1. In an automatic mechanical transmission apparatus with continuous variation of the transmission ratio from an infinite ratio up to a ratio less than 1/1, of the type employing centrifugal forces, comprising a driving shaft and a driven shaft having a common axis, a driving hub driven by the driving shaft, at least one driven plate fast with the driven shaft and bearing at least one continuous circular track, eccentric with respect to the common axis of the driving and driven shafts, rollers which roll inside the circular track, being mounted to rotate about respective longitudinal axes, each of these rollers being borne by a rod connected to a pivot pin on the driving hub, all these pivot axes being uniformly distributed over a circle whose center lies on the common axis of the two coaxial driving and driven shafts,

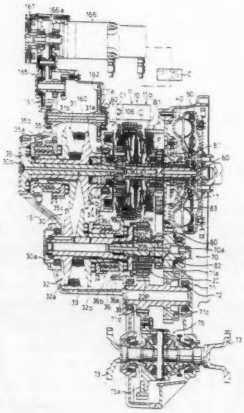
each rod bearing a roller is articulated on the outer part of a weight which is itself articulated on the hub fast with the driving shaft.

5,024,638

ACTUATOR FOR A FRICTIONAL ENGAGING DEVICE

Shiro Sakakibara, Toyokawa; Masahiro Hasebe, and Masashi Hattori, both of Anjo, all of Japan, assignors to Aisin AW Co., Ltd., Anjo, Japan

Filed Dec. 22, 1988, Ser. No. 288,152
Claims priority, application Japan, Dec. 26, 1987, 62-330482; Nov. 18, 1988, 63-291634
Int. Cl.[5] F16D *67/02;* F16H *57/00*
U.S. Cl. 475—210 **21 Claims**



1. An actuator for frictional engaging devices controlled by electric signals from a control device and disposed in a power transmission device, comprising:

a torque generating mechanism which converts electric energy into torque,

at least two movably mounted frictional engaging devices having respective initial first positions,

a torque-thrust conversion mechanism which converts torque generated from said torque generating mechanism into an augmented thrust force for moving said at least two frictional engaging devices from said respective initial first positions to different second positions respectively, said torque-thrust conversion mechanism having a given initial position,

a connecting means which transmits said augmented thrust force generated from said torque-thrust conversion mechanism to each respective one of said at least two frictional engaging devices, and

first spring means for urging at least one of said at least two frictional engaging devices to be in a compressed condition,

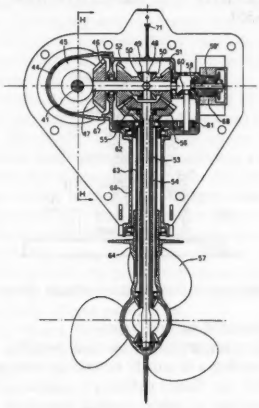
whereby said torque-thrust conversion mechanism can move said at least two frictional engaging devices from said respective initial first positions to the second positions respectively by rotation in one rotational direction from said given initial position.

5,024,639

"Z" TYPE STEERABLE BALANCED POWER TRANSMISSION

Cesare Crispo, Via Milano, 29, 20090 Cusago, Italy

Filed Feb. 8, 1990, Ser. No. 476,708
Claims priority, application Italy, Mar. 29, 1989, 19929 A/89
Int. Cl.[5] F16H *1/38*
U.S. Cl. 475—221 **21 Claims**



1. A "Z" type power transmission for transmitting power from a first drive shaft to a second drive shaft comprising:

a first housing having said first drive shaft and steering control means mounted therein, wherein said first housing is mounted for selective pivotal movement about the axis of said first drive shaft; wherein said transmission may be pivoted about said axis of said first drive shaft while maintaining drive power and steering control;

a steerable second housing responsive to said steering control means rotatably mounted to said first housing and having said second drive shaft mounted therein; and

means for transmitting power from said first drive shaft in said first housing to said second drive shaft in said second housing, including counter rotating coaxial drive shaft means intermediate said first drive shaft and said second drive shaft.

5,024,640

METHOD AND APPARATUS FOR STORING FLAT-FOLDED CASES IN A PILE, AND FOR OPENING AND SEALING SAID CASES

Takashi Saitoh, Tokyo, Japan, assignor to Nagano Technical Service Co., Ltd., Nagano and Technical Products Co., Ltd., Tokyo, both of, Japan

Continuation of Ser. No. 256,391, Oct. 11, 1988, abandoned.
This application May 29, 1990, Ser. No. 530,456
Claims priority, application Japan, Oct. 14, 1987, 62-259031; Sep. 15, 1988, 63-231188
Int. Cl.[5] B31B *3/06, 3/72, 3/78*
U.S. Cl. 493—127 **16 Claims**

1. A method of opening flat folded cases, comprising the steps of:

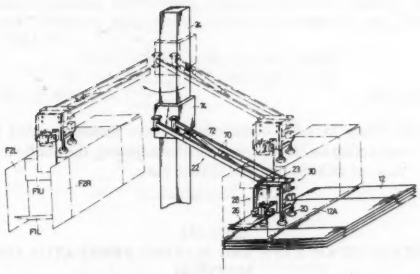
storing a plurality of flat-folded cases horizontally in a magazine, said flat-folded cases forming a pile of cases in said magazine;

lifting an uppermost case from said pile in said magazine at a magazine station, with an end panel of said uppermost case attracted to and held by a suction cup;

said suction cup being mounted on a shaft which is slidably supported in a vertical direction on a pivotable arm, and wherein a spring means is coupled to the shaft to press the suction cup onto said end panel of said uppermost case;

said step of lifting an uppermost case comprising raising said pivotable arm and applying a compression force on said suction cup by means of said spring means such that said compression force applied on said suction cup decreases as said rotatable arm rises to lift said uppermost case;

forming a gap between said uppermost case and a next lower case as said uppermost case is lifted, thereby allowing air to flow in said gap in an increasing amount as said gap increases during said lifting, to prevent lifting of said next lower case with said uppermost case;



folding a bottom upper-inner flap of the end panel of said uppermost case downward at the same time said uppermost case is being lifted, while pressing said suction cup onto the end panel by said compression force;

transferring said uppermost case from said magazine station to a flap-folding station after said bottom upper-inner flap is folded downward so as to open the case in preparation for subsequent folding of other bottom flaps thereof;

folding a bottom lower-inner flap and a pair of bottom outer flaps of the opened case at said flap-folding station;

transferring the case from said flap-folding station to a sealing station; and

sealing the folded bottom outer flaps of the case at said sealing station to form an erected open case.

5,024,641

PROGRAMMABLE DYNAMICALLY ADJUSTABLE PLUNGER AND TRAY FORMER APPARATUS

Jean-Louis Boisseau, Courgerennes, France, assignor to Vega Automation, France

Division of Ser. No. 274,054, Oct. 7, 1988, Pat. No. 4,988,331.
This application Aug. 1, 1990, Ser. No. 561,331
Int. Cl.[5] B31B *3/44, 3/46*
U.S. Cl. 493—171 **5 Claims**

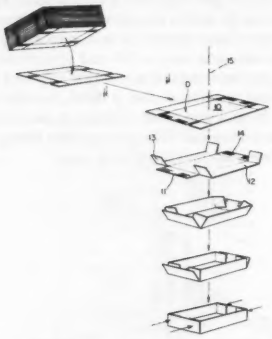
1. Apparatus for die-stamping cardboard blanks, including a supporting framework,

first and second die-stamping means for die-stamping blanks of pieces of cardboard for forming into trays, said first die-stamping means being mounted in said supporting framework and including a first tray-forming part having a selectively adjustable and lockable configuration,

said second die-stamping means being slidably mounted in said supporting framework in axial alignment with said first die-stamping means and including a second tray-forming part having a selectively adjustable and lockable configuration, one of said first and second tray-forming parts being a driving part and the other of said first and second tray-forming parts being a driven part, the configuration of said driven part being determined by the action of said driving part,

selectively lockable single-direction actuator means coupled to and acting on said driven part for urging said driven

part into contact with said driving part when said actuator means is unlocked, and



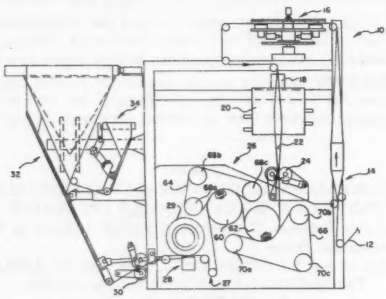
selectively lockable bi-directional drive means coupled to and acting on said driving part for adjusting the configurations of said driving and driven parts.

5,024,642

ROTARY DRAW TAPE BAG MAKING APPARATUS AND METHOD

James E. Buchman, and Kenneth C. Jahnke, both of Appleton, Wis., assignors to Presto Products, Incorporated, Appleton, Wis.

Filed Dec. 5, 1988, Ser. No. 280,027
Int. Cl.[5] B31B *23/60*
U.S. Cl. 493—193 **30 Claims**



28. A method of sealing a thermoplastic draw tape to a thermoplastic bag at a discrete draw tape sealing section, wherein the bag composes one of a plurality of bags formed on a continuous web of thermoplastic material, the bag having a first and a second face and including a hem defining a channel and the draw tape disposed in the channel, thereby defining at least four layers in the section where the tape is disposed in the hem, the method comprising the steps of:

continuously moving the web through a sealing station;

at a first sealing point in the sealing station, forming a heat seal through a portion of the at least four layers of the hem and tape, the seal being formed from the first face of the bag at the sealing section as the web is continuously moved through the sealing station; and

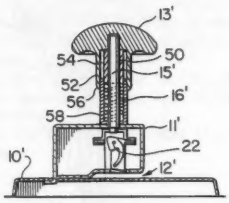
at a second sealing point in the sealing station disposed downstream of the first sealing point relative to the direction that the web is moved, forming a heat seal through the rest of the at least four layers of the hem and tape at the sealing section from the second opposite face of the bag as the web is continuously moved through the sealing station.

5,024,643

STAPLELESS STAPLER

Arnold Kastner, c/o 10220 Armand-Lavergne, Montreal North, Quebec, Canada H1H 3N5

Filed Sep. 20, 1989, Ser. No. 409,697
Claims priority, application Canada, Sep. 27, 1988, 578617
Int. Cl.[5] B31F *5/02;* **B25B** *27/14;* **B25C** *5/00*
U.S. Cl. 493—351 **9 Claims**



1. A stapleless paper fastening apparatus comprising:

a base;

a housing mounted on said base;

a tubular member mounted on said housing, said tubular member having a inwardly extending annular flange at a bottom end, the flange defining a central aperture;

a shaft in tubular member, coaxial therewith and slidable axially through said central aperture into said housing;

a handle reciprocally mounted on said tubular member for movement towards and away from said housing, said handle including an outer annular member slidable on the outside of said tubular member, and also having an inner annular member slidable on the inside of said tubular member;

a spring positioned between said annular flange and a bottom end of said inner annular member, urging said handle away from said housing;

said shaft attached at an upper end to said handle for movement with said handle;

a punch and chisel reciprocally mounted in said housing for movement by said shaft, said punch having a hollow U-shaped cross-section adapted to cut a tongue-shaped section from said sheets;

a bending member pivotally mounted in said punch, said bending member including means for engaging on the bottom part of said housing to pivot the bending member;

the whole arranged such that initial actuation of said handle pushes down said punch and said chisel to cut tongue-shaped sections from said sheet and cut a slot in said sheet, continued actuation of the handle pivoting said bending member to bend up to the tongue for insertion into the slot cut by said chisel.

5,024,644

CONTINUOUS FORM STATIONERY FOLDING AND CUTTING MACHINE

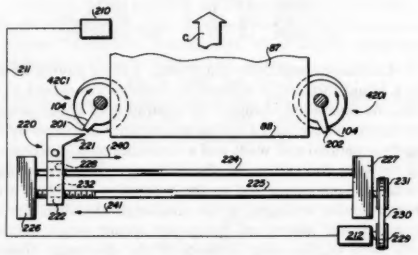
Earnest B. Bunch, III, Glendale, Ariz., assignor to B. Bunch Company, Inc., Phoenix, Ariz.

Continuation-in-part of Ser. No. 279,426, Dec. 2, 1988, Pat. No. 4,915,644. This application Oct. 13, 1989, Ser. No. 421,515
The portion of the term of this patent subsequent to Apr. 10, 2007, has been disclaimed.
Int. Cl.[5] B65H *29/66, 35/06, 45/105*
U.S. Cl. 493—357 **7 Claims**

1. In combination with apparatus for producing continuous form stationery by folding a strip of paper along transverse lines of weakening formed therein,

said paper strip including

a first side, and
a second side opposite and spaced apart from said first side,
each of said transverse lines of weakening including
a first end which is nearer to said first side than said second side of said paper strip, and
a second end which is nearer to said second side than said first side of said paper strip,
said apparatus including
a frame,
oscillating guide means mounted on said frame for alternately distributing said successive lines of weakening in said paper strip in substantially opposite directions,
means for feeding said paper strip into said guide means at a predetermined speed,
folding means carrier on said frame and operatively associated with said oscillating guide means for urging said paper distributed by said guide means into a folded condition, said folding means including a first spiral and a second spiral spaced apart from said first spiral, each of said spirals having helical flight means shaped and dimensioned and rotatably driven to receive said paper strip from said oscillating guide means to fold
said paper strip along said transverse lines of weakening, said first spiral being positioned on said first side of said paper strip, said second spiral being positioned on said second side of said paper strip,
said guide means, feeding means and folding means moving in synchronous relationship during the operation of said apparatus,



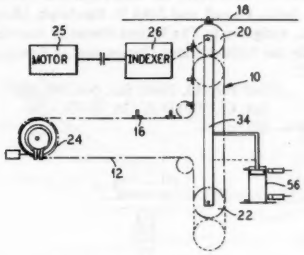
the improvement comprising means for severing the folded paper along at least a selected one of said folded transverse lines of weakening extending between said first side and said second side of said paper strip and extending between said first and said second spirals, said severing means including
(a) cutting means mounted for transverse movement between at least two operative positions,
(i) a first operative position located on said first side of said paper strip and adjacent said first end of said selected one of said transverse lines of weakening, and
(ii) a second operative position located on said second side of said paper strip and adjacent said second end of said selected one of said transverse lines of weakening; and,
(b) means for moving said cutting means from said first operative position to said second operative position at a selected time to cut said one of said folded transverse lines of weakening, said one of said folded transverse lines of weakening interconnecting paper having a portion extending from said one of said lines of weakening
(i) through and contacting said helical flight means of at least one of said first and second spirals, and
(ii) to a folded line of weakening selected from the group consisting of
the folded line of weakening immediately preceding said one of said folded transverse lines of weakening, and,
the folded line of weakening immediately succeeding said one of said folded transverse lines of weakening,
said immediately preceding and immediately succeeding lines of weakening being folded by said folding means.

5,024,645

APPARATUS FOR POSITIONING A PORT IN AN APERTURE IN A WEB OF FILM

Pierre Soubrier, Villecresnes, France, and Xavier Denis, Tournai, Belgium, assignors to Baxter International Inc., Deerfield, Ill.

Filed May 26, 1989, Ser. No. 358,281
Int. Cl.[5] B31B *23/84*; B65G *47/84*
U.S. Cl. 493—380 **24 Claims**



1. An apparatus for positioning ports in an aperture of a web of film comprising:
transporting means, for transporting a port, including a plurality of means for releasably retaining a port;
at least a first rotatable means, for rotating to feed said transporting means, and a second rotatable means, for rotating to feed said transporting means, the transporting means being fed around the first and second rotatable means when the first and second rotatable means rotate, the first rotatable means being coupled to indexing means for accurately regulating the rotation of the first rotatable means; and
means for causing the first rotatable means, and a portion of the transporting means around same, to move automatically repetitively toward and away from a portion of the web of film in a substantially perpendicular direction to the portion of the web of film to position the ports in successive apertures of the film.

5,024,646

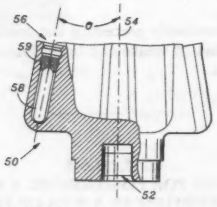
OPTIMUM FIXED ANGLE CENTRIFUGE ROTOR

Mark L. Lewis, Burlingame; Thomas D. Sharples, Atherton, and Stephen E. Little, Cupertino, all of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Oct. 6, 1989, Ser. No. 418,060
Int. Cl.[5] B04B *5/02*
U.S. Cl. 494—16 **20 Claims**

1. A centrifuge rotor comprising:
a rotor body rotatable about a spin axis; and
means formed on the rotor body for supporting a generally cylindrical volume of diameter D and length L of sample solution for centrifugation about the spin axis such that the cylindrical volume is inclined with its axis at an angle θ to

the spin axis, where θ, D and L approximately satisfy the relationship:



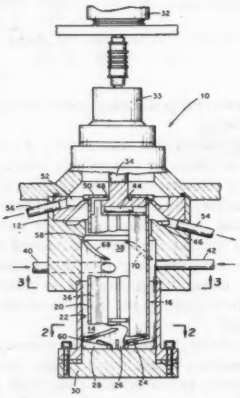
$\theta = \text{Tan}^{-1}(D/15L)^{0.50}$

5,024,647

CENTRIFUGAL CONTACTOR WITH LIQUID MIXING AND FLOW CONTROL VANES AND METHOD OF MIXING LIQUIDS OF DIFFERENT PHASES

Robert T. Jubin, Powell, and John D. Randolph, Maryville, both of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 13, 1989, Ser. No. 365,400
Int. Cl.[5] B01D *21/26*; B04B *1/00*
U.S. Cl. 494—37 **11 Claims**



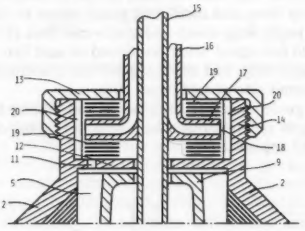
11. A method for mixing process liquids in a centrifugal contactor having an open vertically oriented housing with a vertically oriented rotor disposed therein at a location radially inwardly spaced from the housing so as to define therebetween an annular liquid mixing volume for process liquid of different phases introduced into the mixing volume through inlets in registry with the mixing volume at a location intermediate upper and lower regions thereof, said method comprising the steps of contacting process liquid in the lower region of the mixing volume with vane means disposed on said housing at a location underlying said inlets for urging the process liquid in an upward direction toward said inlets when process liquid is in said mixing volume for enhancing the mixing of the process liquid within the mixing volume and maintaining the level of the process liquid within the mixing volume at a sufficient height to inhibit the creation of vortices and air entrapment in the process liquid due to an insufficient volume of process liquid in the annular mixing volume, and contacting process liquid in an upper region of said mixing volume with further vane means disposed on said housing at a location overlying the inlets for urging the process liquid contacted thereby in a downward direction towards said inlets.

5,024,648

CENTRIFUGAL SEPARATOR WITH A DISCHARGE DEVICE

Claes Inge, Saltsjö-Duvnäs; Peter Franzen, Tullinge; Torgny Lagerstedt, Stockholm; Leonard Borgström, Bandhagen; Claes-Göran Carlsson, Tullinge; Hans Moberg, Stockholm, and Olle Näbo, Tullinge, all of Sweden, assignors to Alfa-Laval Separation AB, Tumba, Sweden

PCT No. PCT/SE88/00510, § 371 Date Jan. 17, 1990, § 102(e) Date Jan. 17, 1990, PCT Pub. No. WO89/03250, PCT Pub. Date Apr. 20, 1989
PCT Filed Oct. 4, 1988, Ser. No. 458,622
Claims priority, application Sweden, Oct. 8, 1987, 87038840
Int. Cl.[5] B04B *11/00*
U.S. Cl. 494—56 **20 Claims**



1. Centrifugal separator comprising: a rotor having an inlet for a liquid mixture, a separation chamber connected to the inlet, the separation chamber for separation of components of the liquid mixture, and a discharge chamber delimited by two axially separated end walls and a circumferential wall extending between the end walls, the discharge chamber having a discharge inlet connected to the separation chamber, a discharge device arranged in the discharge chamber, the discharge device having an outlet, and means which together with parts of the inner surfaces of the discharge chamber arranged, during operation of the rotor, to entrain into rotation a liquid component present in the discharge chamber so that it forms a rotating liquid body having a radially inward essentially circumferential free liquid surface positioned radially inside the circumferential wall, the discharge device during operation extending from a liquid free central part of the discharge chamber to a level radially inside the free liquid surface, said entraining means having at least one annular disc extending around the rotational axis of the rotor and fixedly joined to the rotor, at least one part of the entraining means extending radially outside the level of the free liquid surface but radially inside the level of the outermost part of the discharge device.

5,024,649

BOWL HEAD ASSEMBLY

Clement V. Smith, Attleboro, Mass., assignor to Bird Machine Company, South Walpole, Mass.

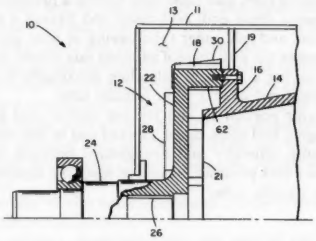
Filed Aug. 30, 1988, Ser. No. 238,761
Int. Cl.[5] B04B *11/08*
U.S. Cl. 494—85 **14 Claims**

1. A centrifuge bowl head comprising,

a bowl head plate,

a bowl spoke attached to an outer circumference of said bowl head plate, said bowl spoke extending axially and perpendicularly from said bowl head plate,

a bowl spoke plow attached to a first edge of said bowl spoke, said bowl spoke plow having a first surface, said



first surface impinging on a wearing material at a first angle, said first angle being less than seventy-five degrees.

5,024,650

STRESS DISSOLVING REFRESHMENT SYSTEM

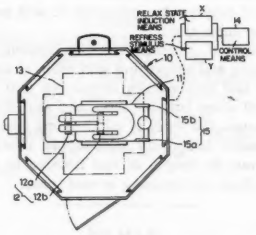
Hiroshi Hagiwara, Katano; Kazunori Araki, Kita Katsuragi, and Akihiro Michimori, Nishinomiya, all of Japan, assignors to Matsushita Electric Works, Ltd., Japan

Filed Jan. 6, 1990, Ser. No. 475,990

Claims priority, application Japan, Feb. 15, 1989, 1-35224; Feb. 15, 1989, 1-35225; Jul. 15, 1989, 1-182793

Int. Cl.[5] A61M *21/00*

U.S. Cl. 600—26 **24 Claims**



1. A stress dissolving refreshment system comprising a relaxed state induction means for providing to the user a stimulation which reduces the user's stress and leads the user to a relaxed state during a relaxing period, a refresh stimulus means for providing to the user a stimulation to elevate the level of the user's consciousness during a refreshing period which including a disillusion period following said relaxing period, and a control means for actuating said relaxed state induction means and thereafter said refresh stimulus means, wherein after said actuation of said relaxed state induction means during said relaxing period for inducing the user to said relaxed state, said control means actuates said refresh stimulus means so as to generate a weak stimulation during said disillusion period for gradually elevating the level of the user's consciousness and thereafter to generate a strong stimulation during remaining part of the refreshing period for elevating the level of the consciousness to a level good enough for allowing the user to immediately return to normal work.

5,024,651

ATHERECTOMY SYSTEM WITH A SLEEVE

Samuel Shiber, Woburn, Mass., assignor to Surgical Systems & Instruments, Inc., Mundelein, Ill.

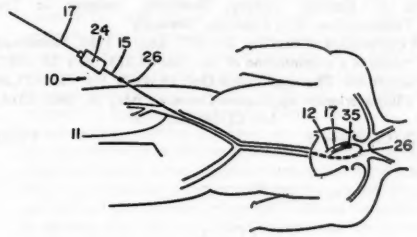
Continuation-in-part of Ser. No. 286,509, Dec. 19, 1988, Pat. No. 4,894,051, which is a continuation-in-part of Ser. No. 243,900, Sep. 13, 1988, Pat. No. 4,886,490, which is a continuation-in-part of Ser. No. 78,042, Jul. 27, 1987, Pat. No. 4,819,634, and a continuation-in-part of Ser. No. 205,479, Jun. 13, 1988, Pat. No. 4,883,458, and a continuation-in-part of Ser. No. 225,880, Jul. 29, 1988, Pat. No. 4,842,579, said Ser. No. 78,042, and Ser. No. 205,479, and Ser. No. 225,880, each is a continuation-in-part of Ser. No. 874,546, Jun. 16, 1986, Pat. No. 4,732,154, which is a continuation-in-part of Ser. No. 609,846, May 14, 1984, abandoned. This application Mar. 13, 1989, Ser. No. 322,497

Claims priority, application European Pat. Off., Jun. 15, 1987, 87305277.3; Canada, Jun. 16, 1987, 539735; Japan, Jun. 16, 1987, 62-150056; Canada, Sep. 15, 1988, 577462; European Pat. Off., Sep. 16, 1988, 88308555.7; Japan, Sep. 30, 1988, 63-247261

The portion of the term of this patent subsequent to Jan. 16, 2007, has been disclaimed.

Int. Cl.[5] A61B *17/32*

U.S. Cl. 604—22 **14 Claims**



1. An atherectomy system for removing an obstruction from within a patient's vessel, comprising in combination:

a flexible guide-wire insertable into the vessel,

a flexible rotary catheter for cutting and ingesting obstruction material, insertable into the vessel over said flexible guide-wire, said flexible rotary catheter having a blade at its distal end and coupling means for connecting it to a power source, at its proximal end,

a sleeve, in which said flexible rotary catheter is slidably and rotatably disposed, having a window near its open distal end.

5,024,652

OPHTHALMOLOGICAL DEVICE

Vladimir A. Dumenek, prospekt Gagarina, 216, kv. 38, Gorky; Georgy E. Stolyarenko, ulitsa Ramenki, 9, korpus 1, kv. 1, Moscow, and Leopold V. Kossovsky, ulitsa Usilova, 1, korpus 3, kv. 15, Gorky, all of U.S.S.R.

Continuation of Ser. No. 248,968, Sep. 26, 1988, abandoned. This application May 17, 1990, Ser. No. 525,304

Int. Cl.[5] A61B *17/20*

U.S. Cl. 604—22 **13 Claims**

1. An ophthalmological device, comprising:

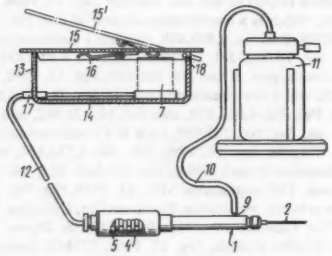
a surgical instrument comprising inner and outer, coaxial elements each having surgical means on one end for introduction into and performing a surgical procedure on a patient's eye and an opposite end;

a housing fixedly connected to the opposite end of the outer element for holding the surgical instrument;

hydraulic drive means operative in response to hydraulic pressure for moving the inner element relative to the outer element and

pressure-exerting means for providing the hydraulic pressure, the pressure-exerting means forming a closed hydraulic system with the hydraulic drive means,

wherein said hydraulic drive means comprises a first bellows accommodated inside said housing and connected to said inner element; a second bellows located in said pressure-



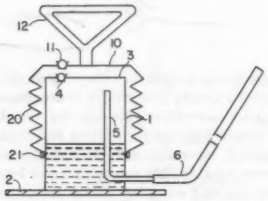
exerting means; and piping communicating said first bellows with said second bellows to establish a closed hydraulic system.

5,024,653

ASPIRATOR

Ole B. Kohnke, Lyngby, Denmark, assignor to Testa-Laboratorium A/S, Glostrup, Denmark

Continuation of Ser. No. 227,457, Aug. 2, 1988, abandoned, which is a continuation of Ser. No. 49,213, May 13, 1987, abandoned. This application Oct. 25, 1989, Ser. No. 427,943
Claims priority, application Denmark, May 16, 1986, 2314/86
Int. Cl.[5] A61M *1/00*
U.S. Cl. 604—35 **8 Claims**



1. An aspirator for removing a body fluid from a body cavity comprising one receptacle for aspirated fluid, said one receptacle being at least partially surrounded by a reciprocable cap-shaped pump member connected with and capable of generating a vacuum within the one receptacle by displacement of the cap-shaped pump member relative to the one receptacle, the cap-shaped member comprising a one-way valve in communication with the ambient air and which closes when the pressure within the cap-shaped pump member falls below the ambient pressure, the one receptacle comprising a one-way valve in communication with the cap-shaped pump member and which closes when the pressure within the cap-shaped pump member exceeds the pressure within the one receptacle, and an inlet for aspirated liquid provided in the upper part of the one receptacle, said inlet being connected with an aspirating tube having a free end capable of being inserted into a body cavity.

5,024,654

INSULATED INFUSION AND ASPIRATION PROBE

Hugh J. Tyler, Santa Ana, Calif., assignor to Alcon Surgical, Inc., Fort Worth, Tex.

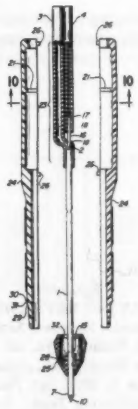
Filed Oct. 2, 1989, Ser. No. 415,904
Int. Cl.[5] A61M *3/00*
U.S. Cl. 604—43 **9 Claims**

4. A surgical instrument comprising:

(a) an outer transfer tube having a proximal end and a tapered, open, distal end, said distal end having at least one opening formed in the wall thereof adjacent said open distal end;

(b) an inner transfer tube housed within and concentric to said outer tube, said inner tube having a proximal end and a tapered distal end, said distal end having a closed tip portion, and said inner tube having at least one opening formed in the wall thereof adjacent said closed tip portion, and having a segment extending proximally beyond the proximal end of said outer transfer tube,

an exterior portion of said tapered end of said inner tube engaging said open, distal, tapered end of said outer transfer tube, whereby said engagement between said tubes forms a seal proximal to said at least one opening of said inner transfer tube;



(c) a first supply tube connected to said proximal end of said outer transfer tube and having said proximally extending segment of said inner transfer tube extending through the wall of said first supply tube,

(d) a second supply tube connected to said proximal end of said inner tube; and

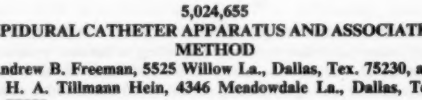
(e) an elongated, generally tubular housing, said housing contracting and supporting said tubes at the ends of said housing and substantially contacting said outer transfer tube, said inner transfer tube, and said first and second supply tubes, the walls of said housing being spaced from said transfer tubes and said supply tubes substantially throughout the length of said housing to minimize heat transfer from said housing to said tubes.

5,024,655

EPIDURAL CATHETER APPARATUS AND ASSOCIATED METHOD

Andrew B. Freeman, 5525 Willow La., Dallas, Tex. 75230, and H. A. Tillmann Hein, 4346 Meadowdale La., Dallas, Tex. 75229

Filed Sep. 5, 1989, Ser. No. 403,107
Int. Cl.[5] A61M *25/00*
U.S. Cl. 604—53 **7 Claims**



1. Catheter apparatus comprising:

an elongated flexible catheter member having distal and proximal end portions;

a first lumen extending longitudinally through said catheter

member and having an outlet on said distal end portion and an inlet on said proximal end portion;

a second lumen extending longitudinally through said catheter member and having an outlet on said distal end portion and an inlet on said proximal end portion spaced longitudinally apart from said first lumen inlet; and

inlet fitting means removably securable over said proximal end portion for defining separated outward extensions of said first and second lumen inlets for receiving first and second fluids from sources thereof and respectively flowing the received first and second fluids into and through said first and second lumens, said inlet fitting means including:

a generally tubular body adapted to coaxially receive said proximal end portion,

a cap member threadable onto one end of said tubular body with said proximal end portion received therein, and

means, responsive to installation of said cap member, for frictionally retaining said proximal end portion within said tubular body and defining said separated outward extensions of said first and second lumen inlets, said means for frictionally retaining including a duality of hollow tubular compression members disposed within said generally tubular body for coaxially receiving said proximal end portion, and a hollow tubular rigid spacing member coaxially disposed between and separating said compression members within said tubular body, said spacing member being adapted to coaxially receive said proximal catheter end portion and having at least one side wall opening formed therethrough,

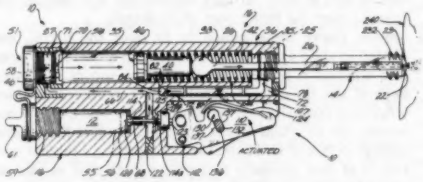
said cap member, in response to tightening thereof onto said tubular inlet fitting body, being adapted to axially and radially deform said compression members in a manner causing both of them to be radially compressed between the interior side surface of said tubular body and the exterior side surface of said proximal end portion of said catheter member to thereby create within said tubular body two separate fluid tight seals longitudinally spaced apart along said proximal end portion.

5,024,656

GAS-PRESSURE-REGULATED NEEDLELESS INJECTION SYSTEM

Jack S. Gasaway, Irvine; J. Stuart Parsons, Laguna Niguel, and Robert L. Harshman, Chino Hills, all of Calif., assignors to Injet Medical Products, Inc., Irvine, Calif.

Filed Aug. 30, 1988, Ser. No. 238,360
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—70 **38 Claims**



1. A gas-pressure-actuated needleless hypodermic device for injecting liquid medication through the skin of persons or animals, the device comprising:

(a) an ampule assembly comprising:

(i) a body having a cavity for holding liquid medication between first and second ends of the body;

(ii) an orifice in the first end of the body through which such liquid medication can flow into and out from the cavity; and

(iii) a plunger assembly movable within the cavity for drawing the liquid medication into the cavity and for forcing the liquid medication out from the cavity;

(b) an injector assembly for receiving and mounting the ampule assembly and for providing a force to move the plunger assembly to thereby force the liquid medication through the ampule assembly orifice, the injector assembly comprising:

(i) an injector body including a barrel closed at its back end, wherein the front end of the barrel is open and configured to receive the second end of the ampule assembly body to thereby mount the ampule assembly on the barrel;

(ii) a piston mounted for sliding movement in the barrel, the piston configured to be pushed by gas pressure from an at-rest position at the back end of the barrel toward the front end of the barrel;

(iii) a chamber in the injector body configured to house a compressed gas container;

(iv) a first passageway in the injector body through which gas flows from the gas container in the gas container chamber to the barrel to provide a force on the rearward-facing surface of the piston to move the piston toward the front end of the barrel;

(v) a second passageway in the injector body configured to be open for venting gas released from the gas container to the atmosphere when the end of the ampule assembly is not mounted in the injector assembly barrel;

(vi) means for sealing the second passageway to prevent venting gas through the passageway to the atmosphere, the seal provided only when the ampule assembly is mounted in the injector assembly barrel; and

(vii) means for releasing gas from the gas container to provide the force on the rearward-facing surface of the piston to thereby move the piston toward the front end of the barrel and into contact with the plunger assembly and for moving the plunger assembly toward the orifice to thereby eject the liquid medication from the cavity out through the orifice.

5,024,657

DRUG DELIVERY APPARATUS AND METHOD PREVENTING LOCAL AND SYSTEMIC TOXICITY

Thomas E. Needham, Deerfield; Jeremy C. Wright, Lake Forest; Steve Pearson, Ingleside; Rao Chilamkurti, West Chicago, and Clinton V. Kopp, Barrington, all of Ill., assignors to Baxter International Inc., Deerfield, Ill.

Continuation of Ser. No. 721,999, Dec. 3, 1984, abandoned. This application May 4, 1990, Ser. No. 518,272
Int. Cl.[5] A61M *5/14*
U.S. Cl. 604—85 **42 Claims**

1. Apparatus for the safe delivery of a beneficial agent to a patient, comprising:

(a) means defining a chamber adapted for receiving a beneficial agent, said chamber having a fluid pathway there-

through, said chamber-defining means including an inlet and an outlet defining part of said fluid pathway; and

(b) means for controlling the rate of delivery of the beneficial agent out of said outlet and into a patient, said control means being capable of producing first and second delivery modes for the beneficial agent when the beneficial agent is being delivered to a patient, such that in said first delivery mode the fluid flow rate through said chamber is high enough that the rate of delivery of the beneficial agent is substantially independent of the fluid flow rate through said chamber, wherein the rate of delivery of the beneficial agent, when the agent delivery rate is independent of fluid flow rate, is at a rate high enough to create, but for said second delivery mode, a locally toxic concentration of beneficial agent in the fluid delivered to the patient, and such that in said second delivery mode, the fluid flow rate through said chamber is slow enough that the rate of delivery of the beneficial agent is at least partially dependent upon the fluid flow rate through said chamber;

(c) said control means causing said second delivery mode to include fluid flow rates high enough to prevent a locally toxic concentration of beneficial agent in the fluid delivered to the patient, said control means furthermore causing said first delivery mode to include fluid flow rates low enough to prevent a systemically toxic concentration of beneficial agent in the bloodstream of the patient.

5,024,658

METHOD AND DEVICE FOR THE DIAGNOSIS AND TREATMENT OF NASAL DISEASES

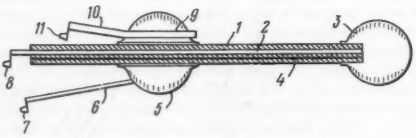
Vladimir S. Kozlov, Narodny pereulock, 6kv. 20; Gennady I. Markov, ulitsa Ukhtomskogo, 19, kv. 32, and Vladimir P. Bugrov, ulitsa Uglicheskava,6a, kv. 43, all of Yaroslavl, U.S.S.R.

Filed Jun. 7, 1989, Ser. No. 362,873

Claims priority, application U.S.S.R., Jun. 13, 1988, 4432024; Jun. 13, 1988, 4432025

Int. Cl.[5] A61M *29/00*

U.S. Cl. 604—96 **3 Claims**



1. A device for the diagnosis and treatment of nasal diseases, comprising an elongated flexible body, a longitudinally extending through passage in said body, an inflatable cuff provided intermediate the ends of said elongated body for movement therealong, an inflatable vessel mounted at one end of said elongated body and communicating with said through passage; a tube means rigidly secured in said cuff for axial movement therewith with respect to the body and for communicating with a nasal passage to enable a medical instrument to pass therethrough, evacuate the contents of the nasal sinuses or to introduce medication into the sinuses.

5,024,659

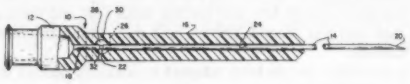
BREAKABLE NEEDLE AND HINGED NEEDLE GUIDE

Douglas D. Sjostrom, Wakefield, Mass., assignor to Smith & Nephew Dyonics Inc., Andover, Mass.

Filed Jan. 10, 1990, Ser. No. 463,176

Int. Cl.[5] A61M *5/50*

U.S. Cl. 604—110 **6 Claims**



1. A needle guide comprising:

a hub having a longitudinal axis;

a needle having a longitudinal axis aligned coaxially with said longitudinal axis of said hub and having a proximal end connected to said hub and a distal end;

said needle having a transverse breaking section adjacent said hub, said breaking section being configured so that said needle breaks in two at said breaking section when a transverse breaking force is applied to said hub; and

a hollow handle extending distally from said hub over and concentric to said needle for a distance distal to said breaking section, said handle having a transverse hinge means adjacent said hub in alignment with said breaking section so that said handle flexes relative to said hub at said hinge means when said transverse force is applied.

5,024,660

SYRINGE SHIELD

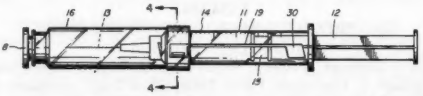
R. David McNaughton, 95 Dobler Ave., Alberta, Canada

Continuation-in-part of Ser. No. 130,277, Dec. 8, 1987, Pat. No. 4,874,383. This application Sep. 12, 1989, Ser. No. 406,276

Claims priority, application Canada, Mar. 17, 1987, 532233

Int. Cl.[5] A61M *5/00*

U.S. Cl. 604—110 **21 Claims**



1. A syringe comprising:

a barrel having an hypodermic needle mounted on one end thereof, a piston mounted for movement longitudinally within the barrel and connected to a handle that projects from the opposite end of said barrel; wherein said barrel is tubular and at least partially transparent in a portion that extends over the major part of its length;

a tubular sleeve dimensioned to fit over the barrel, and guided to slide axially thereon between an extended position wherein it projects from said one end of the barrel beyond the tip of said needle and a retracted position wherein it coaxially surrounds said barrel and exposes said needle for use, said sleeve having a length that corresponds to that of said barrel and comprising a tubular wall that is at least partially transparent such that in said retracted position it affords unimpeded visibility of substantially the entire length of said transparent portion of said barrel;

retaining means to secure said sleeve when in the retracted position, said retaining means being effective to prevent any inadvertent axial or rotational movement of said sleeve relative to said barrel; and

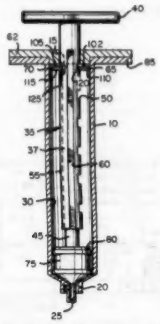
locking means for securely and non-releasably locking the sleeve in said extended position, in which position the needle is fully covered to prevent injury to a user by the needle.

5,024,661

NON-REUSEABLE HYPODERMIC SYRINGE

Harry Wender, Forest Hills, and Augusto F. Avila, Long Island City, both of N.Y., assignors to Empire Research Corporation, Glendale, N.Y.

Filed Aug. 16, 1989, Ser. No. 394,325
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—110 **21 Claims**



1. A hypodermic syringe for single usage, comprising:

a hollow barrel for containing liquid, said barrel having a needle hub for engaging a needle at a front end and having a rear end with an open face, and cover joining means proximate said open face, said barrel having a longitudinal axis;

a plunger shaft within said barrel, said shaft including a rear end, front end and body therebetween, said shaft being adapted to move longitudinally in said barrel when a force is applied thereto;

a cover connected to said cover joining means, said cover having an opening, said rear end of said shaft extending through said opening to be external of said barrel;

first means and second means for engaging said shaft, said first and second engagement means having fixed attachment in relation to said barrel;

third engagement means fixed on said shaft between said shaft ends, said first engagement means when engaged with said third engagement means permitting longitudinal sliding motion of said shaft only away from said needle hub, said second engagement means when engaged with said third engagement means permitting longitudinal sliding motions of said shaft only toward said needle hub, at a given time not more than one of said first and second engagement means being able to engage said third engagement means;

means for releasing said third engagement means simultaneously from said first and second engagement means only when said shaft is withdrawn from said hub, said shaft when released being rotatable about said longitudinal barrel axis from a first angular position where said third engagement means is subject to engagement with said first engagement means to a second angular position where said third engagement means is subject to engagement with said second engagement means, said shaft being subject to withdrawal from said needle hub only one time.

5,024,662

RESISTANCE SYRINGE FOR EPIDURAL ANESTHESIA

Cesar M. Menes, 12905 E. Wolverton, Cerritos, Calif. 90701, and Cenon M. Menes, 212 N. County Line Rd., Hinsdale, Ill. 60521

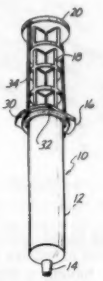
Filed Mar. 13, 1990, Ser. No. 492,749
Int. Cl.[5] A61M *37/00*
U.S. Cl. 604—131 **18 Claims**

1. A disposable syringe for single handed use in guiding an epidural needle into the epidural space of a patient for administration of anesthesia, comprising:

a disposable syringe including a syringe plunger slidable in a syringe barrel between a normal position and a drawn position for discharging fluid contained in said barrel through said needle;

said barrel being attachable to the hub of an epidural needle;

a band of elastomeric material having two ends secured to said barrel at diametrically opposed points thereof;



said band having a portion intermediate said secured ends stretchable over a thumb end of said plunger for biasing said plunger from said drawn position to said normal position;

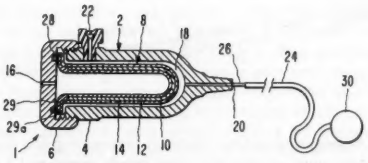
wherein discharge of fluid from said barrel through said needle is normally unrestricted thereby to unambiguously signal the penetration of the epidural space by said needle by immediate and easily perceptible plunger movement from said drawn to said normal position under bias of said band as a result of uncontrolled injection of said fluid into the epidural space.

5,024,663

SELF-CONTAINED SUCTION PUMP

Su Il Yum, Los Altos, Calif., assignor to Alza Corporation, Palo, Calif.

Filed Feb. 21, 1990, Ser. No. 482,572
Int. Cl.[5] A61M *37/00*
U.S. Cl. 604—131 **20 Claims**



1. A self-contained suction pump for drawing a fluid comprising:

a) an impermeable rigid housing;

b) a fluid imbibing means sealingly mounted within the housing and having an external surface which is at least in part permeable to an actuating fluid;

c) a space between the outer wall of the fluid imbibing means and the inner wall of the rigid housing adapted to contain an actuating fluid;

d) an injection port for injecting an actuating fluid in the space between the housing and the fluid imbibing means;

e) a suction port extending through the rigid housing and in communication with the space between the housing and the fluid imbibing means; and

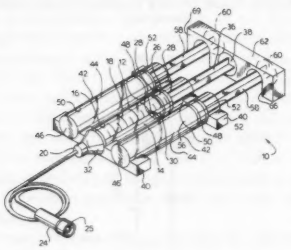
f) sample receiving means adapted to be attached to the suction port and to a fluid sample source.

5,024,664

VACUUM INFUSION DEVICE

Richard J. Mitchell, Lindenhurst, Ill., assignor to Baxter International Inc., Deerfield, Ill.

Filed Apr. 26, 1990, Ser. No. 514,799
Int. Cl.[5] A61M *31/00*
U.S. Cl. 604—143 10 Claims



1. A device for infusing liquid comprising:

a liquid chamber adapted to receive a liquid under pressure, the liquid chamber having a liquid plunger contained within the liquid chamber and a fluid conduit extending from the liquid chamber;

a vacuum chamber, the vacuum chamber having a vacuum plunger contained within the vacuum chamber;

an arm connecting the liquid plunger and the vacuum plunger such that when liquid is introduced into the liquid chamber under pressure the vacuum plunger biases; and

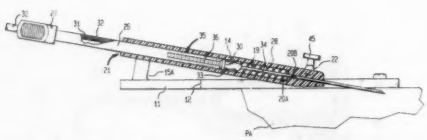
means for preloading the vacuum plunger such that the vacuum plunger does not abut an end of the vacuum chamber housing after infusion.

5,024,665

COMPOSITE CATHETER ASSEMBLY

Jerry M. Kaufman, Eatontown, N.J., assignor to Hemedix International, Inc., Eatontown, N.J.

Continuation of Ser. No. 271,587, Nov. 14, 1988. This application May 11, 1990, Ser. No. 522,382
Int. Cl.[5] A61M *5/32*
U.S. Cl. 604—179 11 Claims



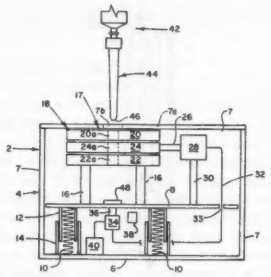
1. A composite catheter assembly for inserting and removing an intravenous catheter including needle means and a ratchet member in a fluid-carrying conduit of a patient, said composite catheter assembly comprising a barrel member having an inner chamber for slidably accommodating said intravenous catheter, whereby said needle means may be maintained in a retracted position entirely within said barrel member and slidably moved from said retracted position entirely within said barrel member into an extended position into said fluid-carrying conduit of said patient, retraction means comprising a resilient assembly for operatively retracting and returning said needle means into said barrel member from said extended position to said retracted position, and latch means operatively associated with said resilient assembly for actuating said intravenous catheter to move said needle means from said extended position to said retracted position, said latch means including pivotally mounted lever means on said barrel member disposed for releasable engagement with said ratchet member on said intravenous catheter when said needle means is moved to said extended position to releasably lock said needle means in said extended position.

5,024,666

MEDICAL NEEDLE SHEATH HOLDING APPARATUS

Daniel W. Pituch, 3299 Kennett Sq., Pittsburgh, Pa. 15213

Filed Sep. 18, 1989, Ser. No. 408,992
Int. Cl.[5] A61M *5/32*
U.S. Cl. 604—263 12 Claims



1. Apparatus for holding a sheath during unsheathing and resheathing of a needle or catheter, said apparatus permitting a user to perform said unsheathing and resheathing using one hand in a convenient linear stroke-like motion, said apparatus comprising:

means for gripping said sheath, said gripping means being positionable to an operative sheath-gripping position and an inoperative non-gripping position; and

actuator means controlled by a sensor for positioning said gripping means into said operative and inoperative positions,

whereby said apparatus, when said gripping means are in said operative position, gently yet firmly holds said sheath so that the needle or catheter can be inserted into and removed from the sheath, and, when said gripping means are in said inoperative position, a sheathed needle or catheter be can be inserted into and removed from said apparatus.

5,024,667

DISPOSABLE ARTICLE CONSTRUCTION

David B. Malcolm, Maplewood, and William L. Bunnelle, Hugo Township, Washington County, both of Minn., assignors to H. B. Fuller Licensing & Financing, Inc., Wilmington, Del.

Filed Nov. 7, 1988, Ser. No. 268,003
Int. Cl.[5] A61F *13/15*
U.S. Cl. 604—382 16 Claims

1. A disposable diaper comprising (i) a polymeric film substrate, (ii) at least one absorbent layer, and (iii) an elastic band, wherein the absorbent layer and the elastic band are independently bonded to the substrate with a hot melt adhesive composition, said adhesive comprising:

(a) about 5 to 14 wt-% of a radial block copolymer having a molecular weight of at least about 185,000, having the formula:

$$(AB)_{n1}—Y—(B)_{n2}$$

wherein Y is a multivalent coupling agent, A comprises a polyvinyl substituted aromatic block, B comprises a polybutadiene rubbery midblock, n1 is an inter of 3 to 10 and n2 is an integer of at least 0 to 10;

(b) about 45 to 85 wt-% of a compatible tackifying resin selected from the group consisting of a C_5 resin, a styrenated C_5 resin, a styrenated terpene resin, a hydrogenated C_9 resin, a rosin derivative, a styrenated terpene resin and mixtures thereof; and

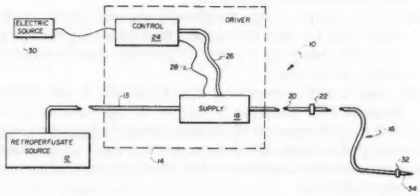
(c) about 5 to 25 wt-% of a plasticizing oil.

5,024,668

RETROGRADE PERFUSION SYSTEM, COMPONENTS AND METHOD

Jeffrey L. Peters, and Jeffrey L. Orth, both of Salt Lake City, Utah, assignors to Rocky Mountain Research, Inc., Salt Lake City, Utah

Filed Jan. 20, 1987, Ser. No. 5,092
Int. Cl.[5] A61M *29/02*
U.S. Cl. 606—194 **51 Claims**



1. A catheter comprising:

cannula means having a proximal end, a distal end in fluid communication with a corporeal lumen, and a channel for communication of fluids between said distal and proximal ends, said cannula means being formed for positioning within said corporeal lumen and for connection to external means when positioned in said corporeal lumen;

balloon means attached to said cannula means proximate said distal end and operable between an inflated condition in which said balloon means substantially occludes said corporeal lumen and a deflated condition in which said balloon means is collapsed about said cannula means, said balloon means being sized and shaped to facilitate fluid flow therepast in said lumen when in said deflated condition;

connector means attached to said proximal end for connection to a fluid reservoir;

balloon inflating means associated with said cannula means for operating said balloon means between said inflated and deflated conditions, said balloon inflating means including a second channel formed in said cannula means and a port formed in said cannula means in fluid communication between said second channel and the interior of said balloon means; and

pressure sensing means to sense the pressure of fluids within said lumen and communicate signals reflective thereof at said proximal end, said pressure sensing means including a port formed in said cannula means between said balloon means and said distal end and a third channel formed in said cannula means in fluid communication with said port to communicate fluid pressure signals therethrough.

5,024,669

ARTIFICIAL LIGAMENT OF DIFFERENTIAL WEAVE STRUCTURE

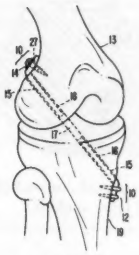
Robert H. Peterson, Rancho Santa Margarita, and Erin McGurk-Burleson, San Clemente, both of Calif., assignors to Baxter International Inc., Deerfield, Ill.

Filed Sep. 9, 1988, Ser. No. 242,199
Int. Cl.[5] A61F *2/08*
U.S. Cl. 623—13 **17 Claims**

1. An artificial ligament of a generally multilayered or tubular woven structure having weft and warp yarns of low elasticity, comprises:

(a) an intra-articular region having highly crimped synthetic warp yarns, wherein the degree of crimping of the warp yarns is such that, within the range of normal physiological loads, the intra-articular region has an elongation at failure and an elasticity substantially the same as those of a normal neutral ligament of the type that the artificial ligament is intended to replace;

(b) a tunnel region having warp yarns wherein the degree of crimping of the warp yarns in the end region is substantially less than in the intra-articular region, such that the elongation of the end region under load is substantially less than that of the intra-articular region, thus providing a strong, stiff matrix for mechanical attachment of the end region to a bone.

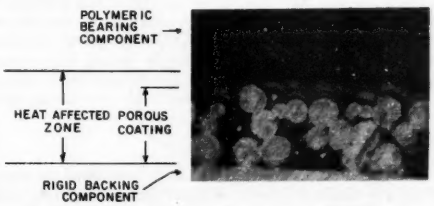


5,024,670

POLYMERIC BEARING COMPONENT

Todd S. Smith, Warsaw, and David C. Kelman, Winona Lake, both of Ind., assignors to DePuy, Division of Boehringer Mannheim Corporation, Indianapolis, Ind.

Filed Oct. 2, 1989, Ser. No. 416,139
Int. Cl.[5] A61F *2/30, 2/38*
U.S. Cl. 623—18 **11 Claims**



1. A load bearing support for an orthopedic prosthesis component comprising a rigid backing component presenting a rigid mating surface having interstices, a polymeric bearing component having a load supporting surface allowing for repeated movable contact with another prosthesis component and wherein said polymeric bearing component also has a corresponding mating surface, said bearing component and backing component being joined together by heating said backing component to a temperature sufficient to reduce the viscosity of the bearing component at its mating surface and by forcing said components together continuously along the mating surfaces with sufficient pressure to cause the bearing component mating surface to flow into the interstices of the backing component mating surface.

5,024,671

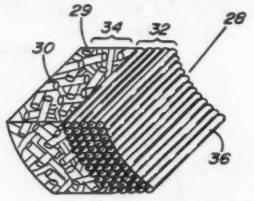
MICROPOROUS VASCULAR GRAFT

Roger Tu, Lake Forrest; David Chen, Irvine, and Wilfred F. Mathewson, Dana Point, all of Calif., assignors to Baxter International Inc., Deerfield, Ill.

Filed Sep. 19, 1988, Ser. No. 246,578
Int. Cl.[5] A61F *2/06*
U.S. Cl. 623—1 **30 Claims**

2. An implantable vascular graft comprised of a tubular body formed from a porous, biocompatible material and having an

inner surface defining an open passageway through which a fluid can pass, said tubular body including porous hollow fibers



with at least a portion of said porous hollow fibers forming at least a portion of said inner surface.

5,024,672

DISPOSABLE DIAPER

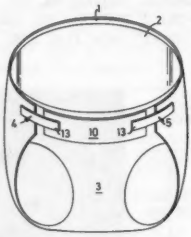
Leif U. R. Widlund, Luktärtsgatan 1C, S-431 32 Mölndal, Sweden

Continuation of Ser. No. 51,192, May 18, 1987, abandoned, which is a continuation of Ser. No. 844,268, Feb. 26, 1986, abandoned, which is a continuation of Ser. No. 543,894, Oct. 20, 1983, abandoned. This application Dec. 8, 1988, Ser. No. 281,457

Claims priority, application Sweden, Oct. 25, 1982, 8206042

Int. Cl.[5] A61F *13/15*

U.S. Cl. 604—390 **2 Claims**



1. A disposable diaper which can be secured about the body of a user by means of pressure-sensitive adhesive tape tabs, said diaper having a first end and a second end opposite said first end, comprising:

a liquid permeable inner layer closest to the user during use of the diaper;

a liquid-tight outer layer having an inner surface and an outer surface;

an absorbent layer disposed between the inner layer and the liquid-tight outer layer;

a pair of tape tabs at said first end of the diaper, each tape tab being positioned close to a respective one of the corners of said first end of the diaper with a first end portion of each of said tape tabs being permanently joined to the liquid-tight outer layer at said first end of said diaper; and

a single plastic strip comprising a material selected from the group consisting of polypropylene and polyester glued on said outer surface of said liquid-tight outer layer, adjacent said second end of said diaper,

said plastic strip having an embassed exposed plastic surface away from the user serving as a tape-receiving surface for releasably fastening the pair of tape tabs when putting the diaper on the user,

said plastic strip comprising a material which has suitable properties for fastening of the pair of tape tabs thereto as well as easy removal of the tape tabs therefrom and refastening of the tape tabs thereto, without risk that the plastic strip will stretch and be broken by the removal of the tape tabs therefrom,

said plastic strip being elongated transversely to the diaper to permit adjustment of the tension of the diaper around the user by loosening at least one of said tape tabs from said plastic strip, adjusting the relative position of the loosened tape tab and the plastic strip, and refastening the tape tab to said plastic strip in the thus adjusted position,

each of said tape tabs having a width no greater than the width of the plastic strip, each of said tape tabs having a second end portion opposite from its first end portion, each said second end portion having a pressure sensitive adhesive on the side thereof that contacts said plastic strip, whereby said plastic strip extends as a belt continuously between the tape tabs when the diaper is secured about the body of the user,

said adhesive having a greater cohesion than the adhesion between said tape tabs and said plastic strip,

and the tear strength of said plastic strip being greater than the adhesive strength of said tape tab adhesive for the material of said plastic strip,

whereby the combination of said liquid-tight outer layer, said plastic strip and the glue therebetween allows said tape tabs with said adhesive thereon to be releasable from and refastenable to said plastic strip without stretching and breaking said plastic strip.

5,024,673

NITROANILINE DYES WITH A CYANO SUBSTITUENT GROUP

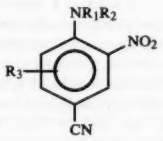
Yuh-Guo Pan, Stamford, and Lana Hochman, Westport, both of Conn., assignors to Clairol Incorporated, New York, N.Y.

Division of Ser. No. 333,528, Apr. 4, 1989, Pat. No. 4,980,158. This application Oct. 11, 1990, Ser. No. 596,120

Int. Cl.[5] A61K 7/13

U.S. Cl. 8—414 9 Claims

1. A hair dye composition comprising 0.001 to 5% of a cyano substituted nitroaniline dye compound having the structure



(I)

wherein R_1 and R_2 are each selected from the group consisting of hydrogen, alkyl, hydroxyalkyl, polyhydroxyalkyl, alkoxyalkyl, hydroxyalkoxyalkyl and aminoalkyl, and R_3 is selected from the group consisting of hydrogen, alkyl, hydroxy, hydroxyalkyl and halogen, the alkyl and alkoxy moieties having from 1 to about 6 carbons; from about 0.01 to about 10% of one or more other dye compounds, and an aqueous vehicle as the remainder.

5,024,674

PROCESS FOR IMPROVING THE DYEABILITY OF WOVEN OR NON-WOVEN TEXTILES: PRE-TREATMENT WITH AQUEOUS DISPERSION OF POLYURETHANE CONTAINING RANDOM CATIONIC GROUPS

Cesare Prelini, Milan; Aldo Trovati, Novara; Tiziana Gambini, Castellanza, and Vittorio Stefanoli, Busto Arsizio, all of Italy, assignors to Raffineria Olii Lubrificanti "R.O.L" S.p.A., Milan, Italy

Continuation of Ser. No. 267,645, Nov. 4, 1988, abandoned, and Ser. No. 135,042, Dec. 18, 1987, abandoned. This application Nov. 9, 1989, Ser. No. 433,993

Claims priority, application Italy, Dec. 24, 1986, 22864 A/86

Int. Cl.[5] D06M 15/56; D06P 1/52, 5/22; C08G 18/48

U.S. Cl. 8—554 11 Claims

1. Process for improving the dyeability of a woven or non-woven textile article which comprises treating the textile article, before dyeing, with an aqueous dispersion of polyurethanes comprising in the macromolecule cationic groups randomly distributed in amounts ranging from 15 to 100 meq per 100 g of dry polyurethane.

5,024,675

APPARATUS FOR FILLING AND SEALING ALKALI METAL ELECTRODE CONTAINERS FOR ALKALI METAL ENERGY CONVERSION DEVICES AND METHOD OF FILLING ALKALI METAL ELECTRODE CONTAINERS FOR ALKALI METAL ENERGY CONVERSION DEVICES

Michael Stackpool, Runcorn, and David Riley, Chester, both of United Kingdom, assignors to Chloride Silent Power Limited, Runcorn, United Kingdom

PCT No. PCT/GB88/00643, § 371 Date Apr. 28, 1989, § 102(e) Date Apr. 28, 1989, PCT Pub. No. WO89/01244, PCT Pub. Date Feb. 9, 1989

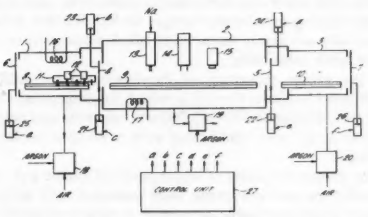
PCT Filed Aug. 3, 1988, Ser. No. 341,099

Claims priority, application United Kingdom, Aug. 3, 1987, 8718375; Aug. 3, 1987, 8718376

Int. Cl.[5] H01M 4/16; B22D 35/06

U.S. Cl. 29—623.1 19 Claims

1. Apparatus for filling and sealing an alkali metal container for an alkali metal energy conversion device, comprising intercommunicating entry, filling and exit chambers, entry and exit doors which are closable to hermetically seal the filling chamber from the entry and exit chambers respectively, hermetically sealable entry and exit hatches to the entry and exit chambers respectively, interlock means to permit opening of said entry or exit hatch only when the respective said entry or exit door is closed, transfer means operable to transfer an alkali metal container to be filled and sealed successively from the entry chamber to the filling chamber and, when filled and sealed, from the filling chamber to the exit chamber, vacuum means arranged for independently controlling the atmosphere in each of the entry, filling and exit chambers to provide a respective pressure of inert gas in each of said changers, heating means arranged for independently controlling the temperatures in at least said entry and filling chambers, and filling and sealing means arranged to fill said container with molten alkali metal and seal said container in the filling chamber, the said transfer means comprising a carriage arranged to hold at least one said electrode container, and respective drive means in each of said chambers for guiding and propelling the carriage in the respective chamber, the respective drive means in adjacent communicating chambers being adapted to co-operate in supporting and propelling the carriage from one said chamber to the next through the open door between the chambers, the carriage having sufficient length in the direction of transfer to ensure full guided supporting engagement with one drive means is retained during transfer at least until the carriage engages the next drive means.



5,024,676

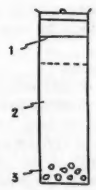
SUPER-HEAVY OIL EMULSION FUEL

Noboru Moriyama, Wakayama; Tsugitoshi Ogura, Kanagawa, and Akio Hiraki, Nagasaki, all of Japan, assignors to Kao Corporation and Mitsubishi Jukogyo Kabushiki Kaisha, both of Tokyo, Japan

Filed Aug. 16, 1989, Ser. No. 394,486

Int. Cl.[5] C10L 1/32

U.S. Cl. 44—301 16 Claims



1. A super-heavy oil emulsion fuel consisting essentially of 100 parts by weight of super-heavy oil, 30–80 parts by weight of water, 0.01–4 parts by weight of at least one anionic surface active agent selected from groups (i)–(vii) enumerated below, and at least one nonionic surface active agent having an HLB (hydrophilic-lipophilic balance) of 9–19 and selected from groups (I)–(VII) enumerated below, wherein the weight ratio of said anionic surface active agent/nonionic surface active agent is from 1/99–75/25;

anionic surface active agents:

(i) the group consisting of formaldehyde condensation products of sulfonic acid or sulfonate salts of cyclic aromatic compounds in which the average degree of condensation of formaldehyde is 1.2–100, wherein the salts are lower amine salts, alkali metal salts or alkaline earth metal salts,

(ii) the group consisting of formaldehyde condensation products of lignosulfonic acid, lignosulfonate salts, derivatives thereof and lignosulfonate and sulfonates of aromatic compounds, and salts thereof, wherein said salts are lower amine salts, alkali metal salts or alkaline earth metal salts, and wherein the average degree of condensation of formaldehyde is 1.2–50,

(iii) the group consisting of copolymers and salts thereof of polystyrene sulfonic acid, salts thereof, or styrene sulfonic acid with other copolymerizable monomers, said copolymers having a molecular weight of 500–500,000, wherein said salts are lower amine salts, alkali metal salts or alkaline earth metal salts,

(iv) the group consisting of dicyclopentadiene sulfonate polymers and salts thereof in which the molecular weight of the polymer is 500–500,000 and wherein said salts are lower amine salts, alkali metal salts or alkaline earth metal salts,

(v) the group consisting of copolymers of maleic anhydride and/or itaconic anhydride, their acids and their salts with other copolymerizable monomers in which the molecular weight of the copolymer is 500–500,000, wherein said salts are ammonium salts or alkali metal salts,

(vi) the group consisting of the maleic compounds and their salts of liquid polybutadiene in which the molecular weight of liquid butadiene is 500–200,000, wherein said salts are ammonium salts, or alkali metal salts,

(vii) the group consisting of the following anionic surface active agents having 1 to 2 hydrophilic groups in the same molecule,

(a) sulfuric ester salts of alcohols having 4–18 carbon atoms wherein said salts are lower amine salts, alkali metal salts or alkaline earth metal salts,

(b) alkanes, alkenes and/or alkylaryl sulfonates or their salts having 4–18 carbon atoms in which said salts are lower amine salts, alkali metal salts or alkaline earth metal salts,

(c) sulfates or phosphate esters and salts of the alkylene oxide addition products of compounds having 1 or more active hydrogens in the same molecule,

(d) sulfosuccinate salts which are esters of saturated or unsaturated fatty acids having 4–22 carbon atoms,

(e) alkyldiphenylether disulfonates and their salts in which the alkyl groups have 8–18 carbon atoms,

(f) rosin acids and their salts, tall oil and mixtures of rosin acid and higher fatty acids and salts thereof, in which the salts are ammonium, sodium or potassium salts,

(g) alkane or alkene fatty acids having 4–18 carbon atoms and their salts in which the salts are ammonium, potassium or sodium;

nonionic surface active agents:

(I) the group consisting of alkylene oxide addition products of compounds having phenolic hydroxyl groups, in which the alkylene oxide is ethylene oxide and/or propylene oxide, butylene oxide or styrene oxide,

(II) the group consisting of the alkylene oxide addition products of formaldehyde condensation products of compounds having phenolic hydroxyl groups, in which a condensation degree is 1.2–100 and the alkylene oxide is ethylene oxide and/or propylene oxide, butylene oxide or styrene oxide,

(III) the group consisting of the alkylene oxide addition products of monovalent aliphatic alcohols and/or aliphatic amines having 2–50 carbon atoms, in which the alkylene oxide is ethylene oxide and/or propylene oxide, butylene oxide or styrene oxide,

(IV) the group consisting of the block or random addition polymers of ethylene oxide and propylene oxide and/or butylene oxide and styrene oxide,

(V) the group consisting of the alkylene oxide addition products of polyhydric alcohols, or esters of said polyhydric alcohols and fatty acids having 8–18 carbon atoms, wherein the alkylene oxide is ethylene oxide and/or propylene oxide, butylene oxide or styrene oxide,

(VI) alkylene oxide addition products of amines having a multiple number of active hydrogen atoms, wherein the alkylene oxide is ethylene oxide and/or propylene oxide, butylene oxide or styrene oxide,

(VII) products of the reaction resulting from the addition of an alkylene oxide to a mixture of 1 mole of triglyceride oil and 1 or 2 or more polyhydric alcohols selected from the group consisting of glycerine, trimethylolpropane, pentaerythritol, sorbitol, sucrose, ethylene glycol, polyethylene glycol having a molecular weight of 1000 or less, propylene glycol, and polypropylene glycol having a molecular weight of 1000 or less, and/or 0.1–5 moles of water, wherein the alkylene oxide is ethylene oxide and/or propylene oxide, butylene oxide or styrene oxide.

5,024,677

CORROSION INHIBITOR FOR ALCOHOL AND GASOHOL FUELS

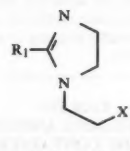
Sophia L. Wang, Houston; George R. Meyer, Missouri City, and Kerry C. Brinkman, Houston, all of Tex., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Jun. 11, 1990, Ser. No. 536,288

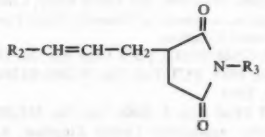
Int. Cl.[5] **C10L** *5/00*

U.S. Cl. 44—335 **21 Claims**

1. A fuel composition for internal combustion engines comprising (a) a major portion of a fuel selected from gasohol or alcohol, and (b) a corrosion inhibiting amount of a mixture of a substituted imidazoline (IM) having the structure



in which R_1 is C_7–C_{24} alkyl or alkenyl or C_6–C_{40} cycloaliphatic and X is —OH or —NH_2, and an alkenyl succinimide (AS) having the structure



wherein R_2 —CH═CH—CH_2 is derived from a C_{10}–C_{30} alpha olefin and R_3-N is derived from a mixture of an aliphatic polyamine, a heterocyclic polyamine, a hydroxyalkylamine and oligomers thereof.

5,024,678

PROCESS FOR THE PREVENTION OR REDUCTION OF DEPOSITS IN CARBURETORS, INJECTION DEVICES AND SIMILAR DEVICES OF ENGINES

Dagmar Mertens-Gottselig, Frechen-Bachem; Hartmut Hammer, Cologne; Heinrich Muller, Wesseling, and Manfred Wildersohn, Eschweiler, all of Fed. Rep. of Germany, assignors to DEA Mineralol Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

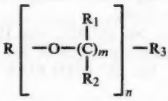
Filed Apr. 5, 1988, Ser. No. 177,623

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1987, 3711985

Int. Cl.[5] C10L *1/18, 1/22*

U.S. Cl. 44—348 37 Claims

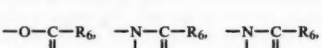
1. Process for the prevention or reduction of deposits in carburetors, injection devices or similar devices of engines, which are operated with alcohol fuels comprising 99.9 to 75 Vol.-% methanol, ethanol or a mixture thereof and at least one corrosion inhibitor, in combination with lubricants, which are suitable for engines operated with hydrocarbon fuels, characterized in that one or several polyol ethers are added to the alcohol fuels in a quantity of 15 ppm to 1 weight-%, whereby the polyol ether(s) has (have) the general formula



wherein R is H, linear or branched C_1–C_{20}-alkyl, C_1–C_{20}-alkenyl, polyunsaturated C_1–C_{20}-alkyl, C_1–C_{20}-cycloalkyl, mono- or bicyclo-C_6–C_{14}-aryl, unsubstituted or substituted;

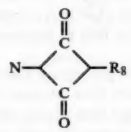
wherein R_1 is H, C_1–C_8-alkyl, unsubstituted or substituted aryl;

wherein R_2 is H, C_1–C_8-alkyl, unsubstituted or substituted aryl and wherein R_3 is OR_5, SR_5, $N(R_5)_2$, wherein R_5 is H, linear or branched C_1–C_{20}-alkyl, C_1–C_{20}-cycloalkyl, mono- and bicyclo-C_6–C_{14}-aryl, unsubstituted or substituted; or



wherein R_6 is H, a linear or branched, saturated or unsaturated C_1–C_{20} alkyl- and mono- or bicycloalkyl group or a substituted or unsubstituted mono- or bicycloaryl group, an unsubstituted or substituted amino group, a substituted or unsubstituted alkoxy group, a substituted or unsubstituted thioether group;

wherein R_7 is a linear, branched, saturated or unsaturated alkyl group, or



wherein R_8 is R_6 and the C=O groups are not directly interconnected or are interconnected by unsubstituted or substituted saturated or unsaturated methylene bridges consisting of 2–5 methylene groups,

or phosphoric esters or thiophosphoric esters;

or alkylethylene diamine tetra acetic acid ester, amide or imide

whereby m of the polyether molecule exclusively is 2 or 3 or 4 or combinations of these numbers, and

n is 2–200.

5,024,679

OLEFINS ETHERIFICATION AND CONVERSION TO LIQUID FUELS WITH PARAFFINS DEHYDROGENATION

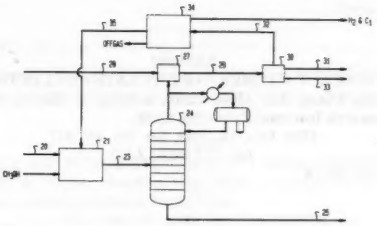
Mohsen N. Harandi, Lawrenceville, and Hartley Owen, Belle Mead, both of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Continuation-in-part of Ser. No. 179,729, Apr. 11, 1988, abandoned, which is a continuation-in-part of Ser. No. 130,261, Dec. 8, 1987, Pat. No. 4,826,507, and a continuation-in-part of Ser. No. 130,259, Dec. 8, 1987, Pat. No. 4,830,635. This application Feb. 15, 1990, Ser. No. 480,710

The portion of the term of this patent subsequent to May 2, 2006, has been disclaimed.

Int. Cl.[5] C10L *1/18;* C07C *41/06*

U.S. Cl. 44—449 20 Claims



1. A process for the conversion of C_2+ hydrocarbons to ether-rich liquid fuels and olefinic gasoline comprising;

(a) reacting a fresh hydrocarbon stream containing C_4+ iso-alkene with an excess of methanol in an etherification zone in contact with an acidic etherification catalyst under etherification conditions whereby an effluent stream containing methyl tertiary alkyl ether is produced;

(b) separating said etherification effluent stream to provide a first stream comprising ether-rich gasoline range hydrocarbons and a second stream comprising unreacted methanol and C_4− or C_5− hydrocarbons;

(c) contacting said second stream with an acidic metallosilicate catalyst in oxygenates and olefins conversion zone under olefins oligomerization conditions at elevated temperature;

(d) separating said conversion zone olefins oligomerization effluent stream in a first stream comprising C_4–C_5 paraffinic hydrocarbon, C_3− hydrocarbons and light gases, and a liquid product stream comprising C_6+ olefinic gasoline;

(e) contacting said C_4–C_5 hydrocarbon stream with a dehydrogenation catalyst under dehydrogenation conditions whereby C_4–C_5 paraffins are converted to C_4–C_5 olefins;

(f) separating effluent from step (e) and passing a portion thereof comprising C_4+ olefins to said etherification zone in conjunction with said fresh hydrocarbon stream and methanol for conversion to methyl tertiary alkyl ethers.

5,024,680

MULTIPLE METAL COATED SUPERABRASIVE GRIT AND METHODS FOR THEIR MANUFACTURE

Sy-Hwa Chen, Salt Lake City, Utah, and Chien-Min Sung, Northboro, Mass., assignors to Norton Company, Worcester, Mass.

Filed Nov. 7, 1988, Ser. No. 261,236

Int. Cl.[5] B24B *1/00*

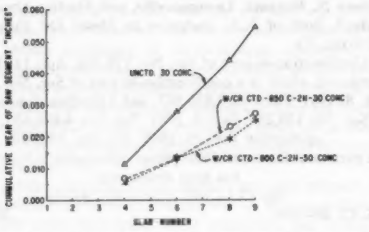
U.S. Cl. 51—295 32 Claims

1. Coated diamond grit comprising:

a diamond particles;

a first coating layer consisting essentially of chromium carbide chemically bonded to said diamond particles; and

a second coating layer comprising an oxidation resistant carbide forming metal having a carbided inner portion



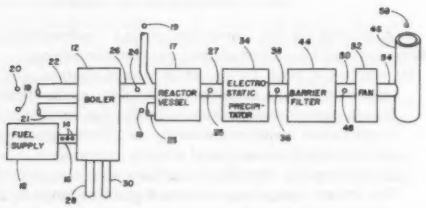
thereof chemically bonded directly to said first coating layer.

5,024,681

COMPACT HYBRID PARTICULATE COLLECTOR

Ramsay Chang, Los Altos, Calif., assignor to Electric Power Research Institute, Palo Alto, Calif.

Filed Dec. 15, 1989, Ser. No. 451,517
Int. Cl.[5] B03C *3/00*
U.S. Cl. 55—6 **9 Claims**



1. A method for removing particulates from flue gas comprising the steps of:

flowing said flue gas through an electrostatic precipitator for removing 90–99% of said particulates, and for imparting a residual electric charge on remaining particulates exhausted from said electrostatic precipitator in said flue gas;

maintaining said residual electric charge on the remaining particulates while flowing said flue gas through a barrier filter placed downstream of said electrostatic precipitator at a high filtration velocity in the range of from 4.06–20.32 centimeters per second (8–40 feet per minute), said barrier filter collecting the charged particulates exhausted from said electrostatic precipitator in said flue gas before said residual electric charge substantially dissipates.

5,024,682

CAUSTIC-IMPREGNATED ACTIVATED CARBONS FOR REMOVAL OF HYDROGEN SULFIDE

Amos Turk, Danbury, Conn., assignor to J. Michael Brassey, Sherman, Conn.

Filed Sep. 4, 1990, Ser. No. 576,783
Int. Cl.[5] B01D *53/00*
U.S. Cl. 55—73 **5 Claims**

1. In a process for removing hydrogen sulfide from an oxygen-containing gas stream by passing said gas stream through caustic-impregnated activated carbon, said stream containing from about 5 ppm to about 10,000 ppm by volume of hydrogen sulfide, the improvement in which the breakthrough capacity of the caustic-impregnated activated carbon for hydrogen sulfide is extended by the addition of ammonia to said gas stream about the time of breakthrough.

5,024,683

SORPTION OF TRIALKYL ARSINES

Patricia A. Tooley, Camden, Tenn.; Tin-Tack P. Cheung, Bartlesville, Okla.; Ted H. Cymbaluk, Bartlesville, Okla.; Gerhard P. Nowack, Bartlesville, Okla., and Marvin M. Johnson, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 12, 1990, Ser. No. 537,320
Int. Cl.[5] B01D *53/04*
U.S. Cl. 55—74 **17 Claims**

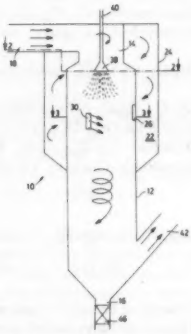
1. A process for at least partially removing trialkyl arsines from fluids comprising the step of contacting a fluid feed which contains at least one trialkyl arsine with a solid sorbent material comprising (a) at least one copper sulfide and (b) an inorganic support material; wherein said contacting is carried out at such contacting conditions as to obtain a fluid product having a lower trialkyl arsine content than said feed, and wherein hydrogen sulfide and free oxygen are substantially absent from said fluid feed.

5,024,684

MULTI-STAGE VORTEX REACTOR

John T. Tank, San Diego, Calif., assignor to Pyropower Corporation, San Diego, Calif.

Continuation of Ser. No. 351,822, May 12, 1989, abandoned.
This application Apr. 6, 1990, Ser. No. 506,593
Int. Cl.[5] B01D *47/00*
U.S. Cl. 55—92 **31 Claims**



16. A method of mixing a fluid stream into a gas stream, utilizing a vortex reactor, having a first generally cylindrical vortex chamber having an inlet and an outlet end, a second generally cylindrical vortex chamber disposed concentrically outside said first vortex chamber, and transfer means for introducing a gas stream tangentially from the second vortex chamber into the first vortex chamber, comprising the steps of:

dividing a gas stream into at least a first and a second gas stream;

introducing said first gas stream through an inlet duct tangentially as a vortex flow into said first vortex chamber at the inlet end of said first vortex chamber;

introducing a fluid stream into said first vortex chamber at the inlet end of the first vortex chamber for mixing the fluid stream into the first gas stream;

directing the second gas stream tangentially as a vortex flow into said second vortex chamber in the inlet end of said first vortex chamber;

introducing gas from said second gas stream in the second vortex chamber through said transfer means into the first vortex chamber at a tangent thereto; and

continuously removing gas through the outlet end of the first vortex chamber.

5,024,685

ELECTROSTATIC AIR TREATMENT AND MOVEMENT SYSTEM

Vilmos Török, Lidingö, and Andrzej Loreth, Åkersberga, both of Sweden, assignors to Astra-Vent AB, Stockholm, Sweden

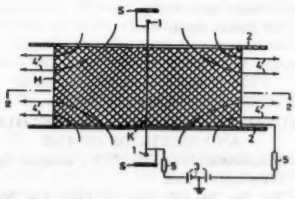
PCT No. PCT/SE87/00595, § 371 Date Jun. 19, 1989, § 102(e) Date Jun. 19, 1989, PCT Pub. No. WO88/04851, PCT Pub. Date Jun. 30, 1988

PCT Filed Dec. 11, 1987, Ser. No. 377,855

Claims priority, application Sweden, Dec. 19, 1986, 8605475; May 11, 1987, 8701916

Int. Cl.[5] B03C *3/00*

U.S. Cl. 55—117 17 Claims



1. A system for generating an air flow comprising

a corona electrode including an elongate thin wire;

a hollow substantially cylindrical target electrode structure having

two axial ends with at least one of said axial ends being open,

and an air permeable cylindrical wall structure;

said corona electrode wire extending along and substantially coinciding with a longitudinal axis of said cylindrical target electrode structure;

a direct current voltage source having

a first terminal connected to said corona electrode,

a second terminal connected to said target electrode structure,

a voltage difference between said first and second terminals of said voltage source to cause an air-ion generating corona discharge at said corona electrode generating an airflow under the influence of air-ions travelling from said corona electrode to said target electrode structure, said airflow entering through said open axial end and exiting through said air permeable cylindrical wall structure;

ring-shaped screening electrodes connected to said corona electrode in axially spaced relationship with ends of said corona electrode wire.

5,024,686

RECYCLE SPRAY GAS-LIQUID CONTACTOR

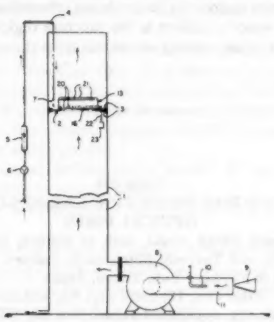
Bernard J. Lerner, 727 Orchard Hill Dr., Pittsburgh, Pa. 15238

Filed Apr. 20, 1990, Ser. No. 512,214

Int. Cl.[5] B01D *47/00*

U.S. Cl. 55—259 13 Claims

13. Apparatus for effecting gas-liquid mass transfer comprising a vertically oriented gas-tight vessel having at the base thereof means for passage of a gas into the vessel and at its top means for passage of a gas therefrom, at least one horizontal tray contained therein, a vertical housing resting on each said tray, an array contained within the housing and occupying an open space in the tray of horizontally aligned spaced apart parallel elongated liquid conductors having liquid-delivery openings to the space between the conductors, said conductors being open to liquid flow from the surrounding tray outside the housing, and, supported upon the upper edges of said housing, an array of foraminous tubes in substantial parallel contact with each other, each said tube being open at at least one end thereof for liquid flow from the tubes; and means for flow of



liquid into substantially the top of the said vessel and for flow of treated liquid from substantially the bottom of the vessel.

5,024,687

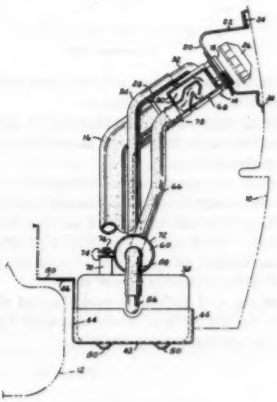
DRY AIR PURGE SYSTEM FOR VAPOR CANISTER

Roger A. Waller, Sterling Hts, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed May 29, 1990, Ser. No. 530,953

Int. Cl.[5] B01D *45/00*

U.S. Cl. 55—316 6 Claims



1. In a vehicle having an internal combustion engine and a fuel vapor storage system including a vapor storage canister which has an air permeable fuel vapor storage medium therein, a purge system for the canister, comprising: air inlet means to the interior of the canister for introducing a flow of air therein during a vapor purge mode of operation; fluid outlet means to the interior of the canister for discharging air and any fuel vapor released from the vapor storage medium during the vapor purge mode of operation; the air inlet means including a water separation device to prevent water from being carried into the canister with the air flow during the vapor purge mode of operation, the water separation device having a thin walled enclosure with an air inlet and air outlet, the enclosure configured to require the air flow therethrough to abruptly change direction and then pass generally upwardly over a surface of an upwardly inclined internal separator wall so that water carried by the air is collected on the internal wall of the enclosure and the inclined walls surface whereby the water is collected in the

region of the juncture between the enclosure wall and the internal separator wall, the separator device having a drain opening means through the enclosure wall which is positioned in the juncture region; the device being oriented so that gravity causes the water to collect in the juncture region and to pass through the drain opening means out from the separator.

5,024,688

METHOD FOR PRODUCING CARBON-COATED OPTICAL FIBER

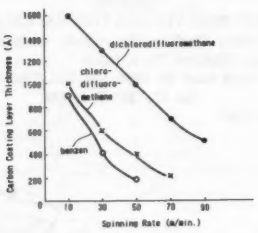
Keiji Oohashi; Shinji Araki, both of Sakura; Hideo Suzuki, Funabashi, and Tsuyoshi Shimomichi, Sakura, all of Japan, assignors to Fujikura Ltd., Tokyo, Japan

Filed Oct. 18, 1989, Ser. No. 423,308

Claims priority, application Japan, Nov. 30, 1988, 63-303758; Dec. 13, 1988, 63-314662

Int. Cl.[5] C03C *25/02*

U.S. Cl. 65—3.12 **3 Claims**



1. A method for producing carbon-coated optical fiber, the method comprising

(a) providing an uncoated non electrically conductive optical glass fiber to be coated with at least one carbon coating layer on the surface;

(b) thermally decomposing a halogenated hydrocarbon compound, wherein said halogenated hydrocarbon compound is at least one compound selected from the group consisting of $CClF_3$, CCl_2F_2, $CCl_3FC_2Cl_2F_4$ and C_2ClF_5, to obtain carbon as a thermal decomposition product of said halogenated hydrocarbon; and

(c) depositing said carbon as said thermal decomposition product on the surface of the uncoated optical fiber to form a protective coating thereon.

5,024,689

NITROGEN FERTILIZER

Allen R. Sutton, Corydon, Ky., and Richard L. Balser, Tulsa, Okla., assignors to Freeport McMoRan Resource Partners, New Orleans, La.

Filed Feb. 8, 1988, Ser. No. 153,594

Int. Cl.[5] C05C *9/00*; C05G *3/00*

U.S. Cl. 71—29 **22 Claims**

1. A method of enhancing the growth of plants by applying to the area where the plants are to be grown an aqueous fertilizer solution comprising ammonium nitrate, urea, dicyandiamide, ammonium thiosulfate and an ammonium phosphate compound, wherein the dicyandiamide is included in the amount of about 1% to about 2% by weight based on the total weight of the solution.

5,024,690

SEED TREATMENT COMPOSITIONS

Charles C. Chollet, Caldwell, Id., assignor to Snake River Chemicals, Inc., Caldwell, Id.

Division of Ser. No. 290,236, Dec. 22, 1988, which is a continuation-in-part of Ser. No. 859,240, May 7, 1986, abandoned, which is a continuation of Ser. No. 696,443, Jan. 30, 1985, abandoned. This application Nov. 15, 1989, Ser. No. 437,276

Int. Cl.[5] A01N *25/00*; C05F *11/00*

U.S. Cl. 71—77 **6 Claims**

1. A method of using comminuted Alder bark as a stimulator of germination which comprises:

dusting a seed with a material consisting essentially of comminuted Alder bark; and

planting the dusted seed.

5,024,691

SUBSTITUTED PHENOXY BENZAMIDE HERBICIDES AND METHODS OF USE

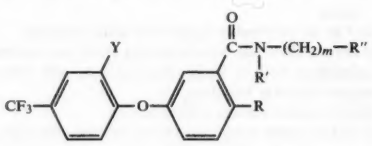
Sreeramulu Nagubandi, New City, N.Y., assignor to ICI Americas Inc., Wilmington, Del.

Division of Ser. No. 704,989, Feb. 25, 1985, Pat. No. 4,632,697. This application Aug. 4, 1986, Ser. No. 892,658

Int. Cl.[5] A01N *37/34*; C07C *255/44*

U.S. Cl. 71—86 **9 Claims**

1. A compound having the formula

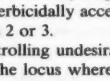


in which

Y is chlorine, bromine, fluorine, iodine, methyl, cyano or hydrogen;

R is nitro, hydrogen or halogen;

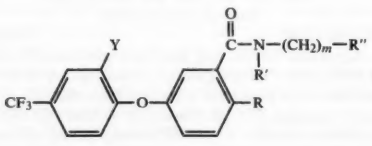
R′ is hydrogen, lower alkyl having 1–10 carbon atoms, $—SCCl_3$,



or $PO_3R^3{}_2$ wherein R^3 is hydrogen, alkyl having 1–10 carbon atoms, or herbicidally acceptable salts;

R″ is cyano; and m is 2 or 3.

7. A method for controlling undesirable weed pests which comprises applying to the locus wherein control is desired a herbicidally effective amount of a compound having the formula

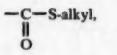


in which

Y is chlorine, bromine, fluorine, iodine, methyl, cyano or hydrogen;

R is nitro, hydrogen or halogen;

R′ is hydrogen, lower alkyl having 1–10 carbon atoms, $—SCCl_3$,



or $PO_3R^3_2$ wherein R^3 is hydrogen, alkyl having 1–10 carbon atoms, or herbicidally acceptable salts;
R'' is cyano; and m is 2 or 3.

5,024,692

HERBICIDAL COMPOSITION AND HERBICIDAL METHOD

Shoin Nagato, Tokyo; Ryusuke Taguchi, Yokohama; Kenji Hirai, Sagamihara; Hiroaki Hirose, and Masahiro Yokota, both of Ichihara, all of Japan, assignors to Kaken Pharmaceutical Co., Ltd.; Sagami Chemical Research Center, both of Tokyo and Chisso Corporation, Osaka, all of Japan

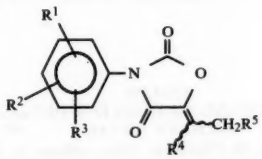
Filed Jul. 7, 1989, Ser. No. 376,570

Claims priority, application Japan, Jul. 14, 1988, 63-173838

Int. Cl.[5] A01N *57/10*

U.S. Cl. 71—86 **8 Claims**

1. A herbicidal composition consisting essentially of a synergistically effective amount of the combination of an oxazolidinedione having the formula:



(I)

wherein R^1, R^2 and R^3 are, independently, halogen, lower alkenyloxy or lower alkynyloxy; R^4 and R^5 are, independently, hydrogen or lower alkyl; and a phosphorus-containing amino acid compound or its salt selected from the group consisting N-(phosphonomethyl) glycine, DL-homoalanin-4-yl-(methyl)-phosphinic acid, L-2-amino-4-{(hydroxy)(methyl)-phosphinyl}butyryl-L-alanyl-L-alanine and salts thereof, wherein the ratio of said oxazolidinedione to said phosphorus-containing amino acid compound or its salt is about 1:1.125 to about 1:10.

5,024,693

HERBICIDES

Peter S. Gates, Fulbourn, and Graham P. Jones, Sawston, both of England, assignors to Schering Agrochemicals Ltd., England

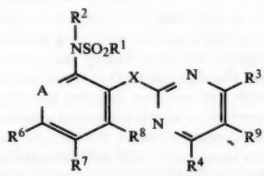
Filed Oct. 2, 1989, Ser. No. 416,153

Claims priority, application United Kingdom, Oct. 4, 1988, 8823288

Int. Cl.[5] A01N *43/54*; **C07D** *401/12, 239/34, 239/52*

U.S. Cl. 71—92 **20 Claims**

1. A sulphonanilide of the formula:



(I)

and salts thereof, where:
A is nitrogen or a group CR^5;
X is oxygen or sulphur;
R^1 is an C_{1-6} alkyl, C_{2-6} alkenyl, C_{2-6} alkynyl, C_{3-7} cycloalkyl, phenyl, pyrrolyl, pyridyl, furyl, thienyl, pyrimidinyl, triazolyl, imidazolyl, benzthiophenyl, dihydrogenzofuranyl, thiazolotriazoly, triazolopyrimidinyl or pyrazolopyrimidinyl or amino group;
R^2 is hydrogen, C_{1-6} alkyl or C_{2-5} alkanoyl, or a group $—SO_2R^1$;
R^3 and R^4, which may be the same or different, are each hydrogen, halo, C_{1-6} alkyl, C_{1-6} alkoxy, C_{3-7} cycloalkyl, amino, pyrrolyl, pyrimidinyl, triazolyl, or imidazolyl;
R^6, R^7 and R^8, which may be the same or different, are each hydrogen, halo, cyano, a group $COOR^{10}$, C_{1-6} alkyl, C_{1-6} alkoxy or amino group;
R^5 is a group as defined above for R^6, R^7 and R^8, or is pyrimidyloxy or triazinyloxy;
R^9 and R^{10} each represent hydrogen of C_{1-6} alkyl group wherein
any alkyl moiety which the groups R^1 to R^{10} represent or contain being optionally substituted by one of more halogen atoms, carboxy groups, cyano groups or alkoxycarbonyl groups of 1 to 4 carbon atoms;
any amino group which the groups R^1 and R^3–R^8 represent being optionally mono- or di-substituted by alkyl of 1 to 4 carbon atoms, alkenyl or 2 to 4 carbon atoms, carbamoyl, or by alkanoyl, alkoxycarbonyl, alkylcarbamoyl or dialkylcarbamoyl in which any alkyl group is of 1 to 4 carbon atoms; and
any phenyl group which group R^1 represents being optionally substituted by one or more alkyl, alkoxy carbonyl or alkylthio of 1 to 4 carbon atoms, halogen, cyano, aminosulphonyl or nitro.

10. A herbicidal composition which comprises an effective herbicidal amount of at least one compound according to claim 1 in combination with a carrier therefor.

5,024,694

HERBICIDAL N-ARYL NITROGEN HETEROCYCLES HAVING FLUORINE-CONTAINING SUBSTITUENTS

Otto Schallner, Monheim; Michael Negele, Cologne; Hans-Joachim Santel, Leverkusen; Klaus Lürssen, Bergisch-Gladbach; Robert R. Schmidt, Bergisch-Gladbach, and Birgit Krauskopf, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

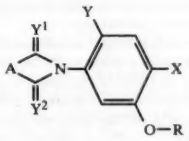
Filed Feb. 6, 1990, Ser. No. 476,224

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1989, 3905006

Int. Cl.[5] C07D *209/48, 209/46, 207/452, 487/04*

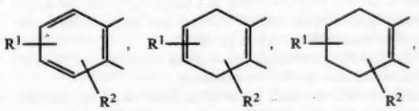
U.S. Cl. 71—95 **11 Claims**

1. An N-aryl nitrogen heterocycle having a fluorine-containing substituent of the formula



(I)

in which
A represents one of the groupings



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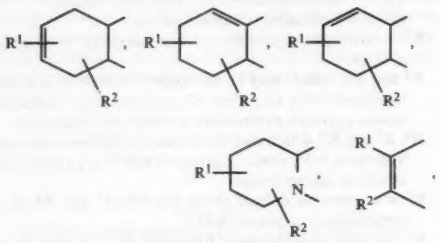


where

R^1 and R^2 in each case independently of one another represent hydrogen, halogen, halogenoalkyl or alkyl, and

Y^1 and Y^2 in each case represent oxygen or sulphur,

R represents in each case optionally branched alkyl, alkenyl, cycloalkyl, cycloalkenyl, cycloalkylalkyl or cyloalkenylalkyl in each case having a carbon-carbon bond interrupted by at least one oxygen atom and in each case substituted by at least one fluorine atom,

X represents hydrogen or halogen and

Y represents hydrogen or halogen.

10. A method of combating unwanted vegetation which comprises applying to such vegetation or to a locus from which it is desired to exclude such vegetation, a herbicidally effective amount of a compound according to claim **1**.

5,024,695

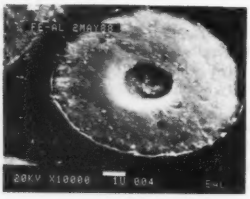
FINE HOLLOW PARTICLES OF METALS AND METAL ALLOYS AND THEIR PRODUCTION

Charles P. Ashdown, Lowell; James G. Bewley, West Boxford, and George B. Kenney, Medfield, all of Mass., assignors to UltraFine Powder Technology, Inc., Ayer, Mass.

Continuation-in-part of Ser. No. 825,079, Jan. 31, 1986, abandoned, Division of Ser. No. 634,785, Jul. 19, 1984, Pat. No. 4,626,278. This application Oct. 26, 1988, Ser. No. 263,048

Int. Cl.[5] B22F *9/06*

U.S. Cl. 75—338 **5 Claims**



1. A method of producing fine hollow metal particles from a melt material, the method comprising:

introducing into the melt material a melt-soluble gas, the gas being substantially more soluble in the liquid state than the solid state of the melt material, in concentration sufficient to cause the gas to come out of solution and form bubbles of the gas in droplets of the melt material formed after atomization thereof;

atomizing by kinetic spray atomization the melt material to produce atomized droplets of the melt material having the melt-soluble gas dissolved therein, the concentration of gas in the melt and the gas pressure and temperature outside of the droplets being in a range to cause the melt-soluble gas to come out of solution and so as to form the droplets into hollow metal particles.

3. A method for producing fine hollow metal particles from a melt material, the method comprising:

introducing into the melt material at least two melt soluble gases, the at least two soluble gases including a first gas and a second gas, wherein the second gas diffuses more slowly in the melt material than the first gas;

atomizing by kinetic spray atomization the melt material to produce a first yield of atomized droplets of the melt material having the at least two melt soluble gases dissolved therein, the concentration of the first and second gases in the melt, the partial pressures of the gases outside of the first yield of droplets, and the temperature outside of the first yield of droplets, being in a range to cause the diffusion of the first gas out of solution, forming bubbles in the first yield of droplets and bursting a substantial proportion thereof so as to form a second yield of droplets of the melt material, the droplets of the second yield being generally finer than those of the first yield, the temperature and the partial pressures of the gases outside of the second yield of droplets being in a range to cause solidification of a substantial proportion thereof only after the second gas begins to diffuse out of solution and so as to form the second yield of droplets into hollow metal particles.

5,024,696

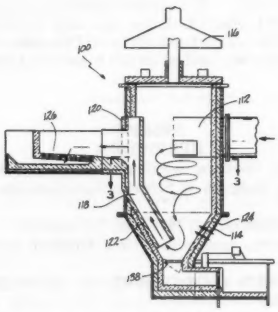
APPARATUS AND METHOD FOR DEGASSING MOLTEN METAL

Thomas J. Ryan, St. Clairsville, Ohio, assignor to Alusuisse-Lonza Services Ltd., Zurich, Switzerland

Filed Jul. 23, 1990, Ser. No. 556,308

Int. Cl.[5] C22B *9/05*; F27D *3/14, 1/16*

U.S. Cl. 75—708 **11 Claims**



1. In an apparatus for use in degassing molten metal including a reaction chamber having an elongated sidewall portion and a central axis, a tangential inlet for the introduction of molten metal and a metal outlet for delivering molten metal to a casting station, and a plurality of fluxing gas nozzle inlets for passing fluxing gas through the molten metal as the molten metal passes through said reaction chamber from the inlet to the outlet, the improvement which comprises a portion of said elongated sidewall portion includes a hollow tube-like section forming said molten metal outlet, said hollow tube-like section having an inlet at a first height below said molten metal inlet and an outlet at a second height above said first height such that said molten metal in said hollow tube-like section passes in a heat exchange relationship with said molten metal in said reaction chamber as metal flows through said reaction chamber and said hollow tube-like section.

5,024,697

COATING COMPOSITION AND METHOD FOR FORMING A SELF-HEATING CORROSION PREVENTATIVE FILM

Perry E. Landers, Russell, and George F. Felton, Ashland, both of Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

Continuation of Ser. No. 818,437, Jan. 13, 1986, abandoned, which is a continuation-in-part of Ser. No. 806,259, Dec. 6, 1985, abandoned.

Filed May 27, 1987, Ser. No. 57,677

Int. Cl.[5] C04B *9/02*

U.S. Cl. 106—14.13 6 Claims

1. An oil-in-water emulsion prepared by diluting a concentrate, with additional water in the range of from about 1 to 20 parts water to each part by weight of the concentrate, the concentrate comprising:

A. about 20 to 95 wt. % of aliphatic or naphthenic oil having a viscosity of about 50 to 500 second (SSU @37° C., 100° F.);

B. about 0.1 to 15 wt. % of stabilizing agent comprising glycol or glycol ethers or derivatives thereof;

C. about 5 to 50 wt. % of emulsifying agent comprising a sulfonate salt of alkaline earth metals;

D. about 0.5 to 10 wt. % of siloxane comprising polyalkylsiloxane or alkylpolysiloxane or derivates thereof;

E. about 0.1 or more wt. % of water.

5,024,698

MONOAZO PIGMENT COMPOSITIONS

Russell J. Schwartz, and Manuel Z. Gregorio, both of Cincinnati, Ohio, assignors to Sun Chemical Corporation, Fort Lee, N.J.

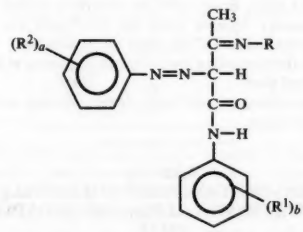
Filed Mar. 22, 1990, Ser. No. 497,385

The portion of the term of this patent subsequent to Aug. 7, 2007, has been disclaimed.

Int. Cl.[5] C09D *11/00, 11/02, 11/16*

U.S. Cl. 106—20 16 Claims

1. An azomethine composition of matter having the formula:



wherein:

R is an alkylene oxide polymer;

R^1 is independently selected from the group consisting of Cl, OCH_3, CH_3, OC_2H_5, C_2H_5 and $CONH_2$;

R^2 is independently selected from the group consisting of Cl, OCH_3, CH_3, NO_2, OC_2H_5, C_2H_5, $CONH_2$, SO_3H, OH and COOH; and a and b are independently integers of 0 to 5.

5,024,699

LEUCO DYES AND RECORDING MATERIALS USING THE SAME

Kiyotaka Iiyama, Sakuramura; Kunio Hayakawa, Gotenba; Masahiro Nakata, Osaka; Kaoru Kodera, Osaka, and Osamu Miyazaki, Osaka, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Division of Ser. No. 200,674, May 31, 1988, Pat. No. 4,925,828.

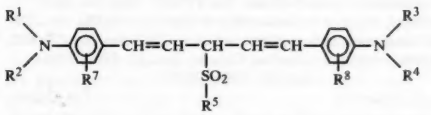
This application Mar. 2, 1990, Ser. No. 487,138

Claims priority, application Japan, May 30, 1987, 62-136055; May 30, 1987, 62-137340

Int. Cl.[5] C09D *11/00;* B41M *5/18*

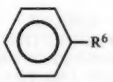
U.S. Cl. 106—21 8 Claims

1. A leuco dye having the formula (I),



(I)

wherein R^1, R^2, R^3 ad R^4 each represent a lower alkyl group; R^5 represents an α-naphthyl group, β-naphthyl group or



wherein R^6 represents —$NHCOR^9$, a halogen or an amino group which is unsubstituted or substituted by one or two C_1–C_4 alkyl groups which are the same or different; and R^7, R^8 and R^9 each represent hydrogen or a lower alkyl group, provided that when both R^7 and R^8 are hydrogen, R^6 represents —$NHCOR^9$ or bromine.

5,024,700

THIXOTROPIC PRINTING INK COMPOSITIONS AND METHODS OF PREPARING SAME

William E. Britton, Jr., Sacramento, Calif., assignor to The Ink Company, W. Sacramento, Calif.

Filed Sep. 5, 1989, Ser. No. 403,687

Int. Cl.[5] C09D *11/02*

U.S. Cl. 106—32 18 Claims

1. An ink composition comprising:

(a) approx. 33.7% by weight of solvent petroleum-based ink solvent

(b) approx. 24.5% by Weight of naphthenic ink oil

(c) approx. 19.0% by weight of hydrocarbon resin(s)

(d) approx. 4.5% by weight of petroleum-process oil

(e) approx. 17.5% by weight of oil-based carbon black

(f) less than 1% by weight of aluminum gellant

(g) approximately 0.07% to 1.5% by weight of triethanolamine.

5,024,701

DENTURE ADHESIVE COMPOSITION

Armand J. Desmarais, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Continuation of Ser. No. 671,277, Nov. 13, 1984, abandoned, which is a continuation-in-part of Ser. No. 519,331, Aug. 8, 1983, abandoned. This application Dec. 22, 1988, Ser. No. 291,412

Int. Cl.[5] C09K *3/00*

U.S. Cl. 106—35 13 Claims

1. A denture adhesive composition consisting essentially of (a) from about 5% to about 50% of a hydrophobically modified water-soluble polymer selected from the group consisting of a hydrophobically modified cellulose ether wherein the cellulose ether is substituted with a hydrocarbon radical having 8 to 25 carbon atoms in an amount from about 0.2 weight

percent to about the amount which renders the cellulose ether less than 1% by weight soluble in water and a copolymer of ethylene oxide and at least one long chain epoxyalkane having 8 to 25 carbon atoms; (b) from about 35% to about 85% of petrolatum; and (c) 0% to about 15% of a material selected from the group consisting of mineral oil and mineral oil admixed with a polyethylene.

5,024,702

SOIL OR AGGREGATE STABILIZING AGENT AND MATRIXES STABILIZED BY SAME

Ludvik Mazuch, 767 Walsred Road, Victoria, British Columbia, Canada V9C 2X3, and David R. Haughton, 2760 Dooley Road, Victoria, British Columbia, Canada V8Y 1R7

Continuation-in-part of Ser. No. 177,825, Mar. 24, 1988, abandoned, which is a continuation of Ser. No. 853,563, Apr. 18, 1986, abandoned. This application Feb. 9, 1989, Ser. No. 309,602

Claims priority, application Canada, Jun. 26, 1985, 485445

Int. Cl.[5] C08L *95/00*

U.S. Cl. 106—277 **14 Claims**

1. An agent for stabilizing soil or aggregate, said agent being formed by mixing asphaltic emulsion, lignosulfonate and water, the volume ratio of lignosulfonate to asphaltic emulsion being in the range of 10:90 to 90:10.

5,024,703

METHOD FOR THE PRODUCTION OF A COMPOUND FOR INCREASING OF FROST-RESISTANCE OF HARDENED CONCRETE AND THE COMPOUND THUS PRODUCED

Gert-Ove Gustafsson, Billdal; Leif Berntsson, Göteborg, and Kåre Larsson, Bjärred, all of Sweden, assignors to Multistructure Sweden AB, Goteborg, Sweden

Filed Jul. 19, 1989, Ser. No. 382,241

Claims priority, application Sweden, Nov. 12, 1984, 8405646

Int. Cl.[5] C04B *22/08, 22/14, 22/12*

U.S. Cl. 106—649 **8 Claims**

1. A method for the production of a compound for increasing the frost-resistance of hardened concrete, the steps comprising;

separating cereal storage proteins from wheat, triticale, barley or rye;

determining an amount of reducing agents to be added to the cereal storage proteins based upon the physical properties of the cereal storage proteins to entrain air in the concrete mass during its mixing;

adding reducing agents selected from the group consisting of ferro sulphate, tin chloride and copper chloride to the cereal storage proteins produced, in an amount of the reducing agents determined in said determining step;

testing the capacity of the compound formed by the cereal storage proteins and the reducing agents to entrain air in the concrete mass during its mixing compared to a standardized air-entraining capacity; and

adding a substance which is inert to air-entraining properties but which will dilute by weight percentage the air-entraining capacity of the compound.

5,024,704

METHOD AND APPARATUS FOR CLEANING CAN OPENERS

Lee J. Prouty, 176 Athol #8, Oakland, Calif. 94606-1737

Filed May 9, 1990, Ser. No. 521,356

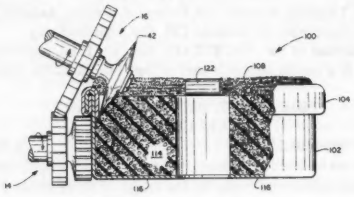
Int. Cl.[5] A47L *25/00*

U.S. Cl. 134—6 **9 Claims**

8. A method of cleaning a can opener having a driving wheel and a cutting element, the cutting element having inner and outer surfaces, comprising:

inserting a can opener cleaner having a first cleaning element between the driving wheel and the cutting element of the can opener;

rotating the driving wheel to rotate the can opener cleaner so that the inner surface of the cutting element is wiped



clean by the first cleaning element of the can opener cleaner.

5,024,705

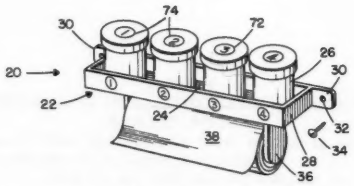
PAINT BRUSH CLEANING SYSTEM

Claire M. Cahill, 300 East Beach Road, Charlestown, R.I. 02813

Filed May 10, 1990, Ser. No. 521,837

Int. Cl.[5] A47L *25/00*

U.S. Cl. 134—38 **15 Claims**



1. A process for cleaning paint brushes whose bristles have, from use, developed liquefied accumulations thereon of an oil base paint, said process comprising the steps of:

providing a plurality of vessels, each containing the same liquid solvent of a type capable of physically loosening and removing from a paint brush the accumulations of paint which have developed thereon;

assembling the vessels into a first predetermined serial relationship;

inserting a paint brush which has accumulations of paint thereon into a first one of the vessels;

vigorously agitating the paint brush in the first one of the vessels so as to physically remove from the brush a maximum amount of the paint accumulations;

removing the paint brush from the first one of the vessels;

wiping the paint brush with an absorbent towel so as to mechanically remove from the bristles of the brush a maximized amount of the paint accumulations;

repeating the preceding two steps in sequence at least one additional time;

thereby providing a brush with cleaned bristles, suitable for use once again.

5,024,706

PIN HETEROJUNCTION PHOTOVOLTAIC ELEMENTS WITH POLYCRYSTAL ALP(H,F) SEMICONDUCTOR FILM

Masahiro Kanai, Tokyo; Tatsuyuki Aoike; Koichi Matsuda, both of Nagahama, and Soichiro Kawakami, Hikone, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 19, 1990, Ser. No. 467,523

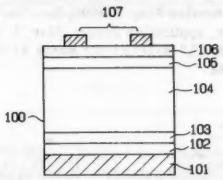
Claims priority, application Japan, Jan. 21, 1989, 1-12504; Jan. 12, 1990, 2-3429

Int. Cl.[5] H01L *31/075, 31/0368, 31/0376*

U.S. Cl. 136—258 **4 Claims**

1. A pin heterojunction photovoltaic element which gener-

ates photoelectromotive force by the junction of a p-type semiconductor layer, an i-type semiconductor layer and an n-type semiconductor layer, characterized in that at least one of said p-type and n-type semiconductor layers comprises a polycrystal semiconductor film comprised of aluminum atoms (Al), phosphorus atoms (P), hydrogen atoms (H), and atoms (M) of a p-type or n-type dopant element, said polycrystal



semiconductor film contains crystal grains of an average size in the range of 50 to 1000 Å, and said polycrystal semiconductor film contains the hydrogen atoms (H) in an amount of 0.5 to 5 atomic %; and said i-type semiconductor layer comprises a non-single crystal semiconductor film containing silicon atoms (Si) as a matrix and at least one kind of atoms selected from the group consisting of hydrogen atoms (H) and fluorine atoms (F).

5,024,707

PROCESS OF DECREASING THE INCRUSTATION IN PHOSPHATING PLANTS

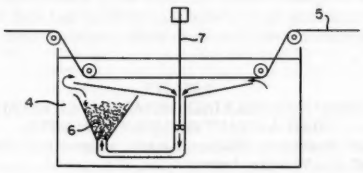
Werner Rausch, Oberursel, Fed. Rep. of Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 22, 1989, Ser. No. 369,743

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1988, 3824063

Int. Cl.[5] C23C *22/07*

U.S. Cl. 148—253 **11 Claims**



1. A process for decreasing the incrustation on plant parts in contact with a phosphating solution in a phosphating plant, comprising: contacting the phosphating solution with a workpiece metal surface; and immediately thereafter while at its working temperature and prior to its contact with the surface of plant parts causing the phosphating solution to contact a second solid surface, which surface is presented in addition to the surface of the plant parts said additionally presented second solids surface being disposed outside of a contact area of the workpiece metal surface with the phosphating solution, the ratio of the second solid surface which is contacted by the phosphating solution to the surface of the plant parts in contact with the phosphating solution being at least 2.

5,024,708

CASTABLE AND/OR PRESSABLE GAS GENERATING PROPELLANTS

Eduard Gast, Kraiburg, and Peter Semmler, Aschau, both of Fed. Rep. of Germany, assignors to Contec Chemieanlagen GmbH, Aschau, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 301,542, Jan. 24, 1989, abandoned. This application Jul. 11, 1990, Ser. No. 551,189

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1988, 3804095

Int. Cl.[5] C06B *45/10*

U.S. Cl. 149—19.1 **2 Claims**

1. A gas generating propellent composition with flame temperature below 1400° K. (isobaric) when are castable and/or pressable consisting essentially of at least one resin binder which is at least one member of the group consisting of polyurethane, polyesters, polybutadienes, ethyl cellulose, cellulose acetate and polybutylenes, optionally at least one additive selected from the group consisting of wetting agents, stabilizers, plasticizers and buring moderators and as the major gas generating constituent, 60 to 80% by weight of triaminoguanidine nitrate based total composition weight said composition being free of nitramine oxidizers, mitrocellulose binder, energetic plasticizers and recorcinol.

5,024,709

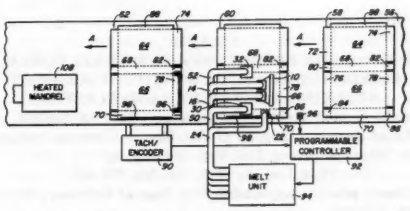
CONTACT-FREE METHOD OF FORMING SIFT-PROOF SEALS

W. Harrison Faulkner, III, and Douglas E. Colton, both of Salinas, Calif., assignors to Slautterback Corporation, Monterey, Calif.

Filed Jan. 22, 1990, Ser. No. 468,368

Int. Cl.[5] B32B *31/06*

U.S. Cl. 156—69 **19 Claims**



1. A method of forming a sift-proof seal for a container having flaps comprising,

moving said container relative to a plurality of closely spaced outlets for extruding adhesive,

extruding adhesive from said nozzles to form a plurality of closely spaced parallel lines of adhesive on a portion of a first flap of said container, said lines of adhesive having gaps therebetween and having lengths generally parallel to said relative movement of said container, the sum of the areas of said gaps between said lines of adhesive being less than that area of said first flap covered by said lines of adhesive, and

compressing said lines of adhesive between said first flap and a second flap, said lines of adhesive being spaced apart such that said compressing causes merging of adjacent lines of adhesive.

5,024,710

PROCESS OF APPLYING A SPECULAR SURFACE FINISH TO A CARBON-CARBON SUBSTRATE

Patrick M. Sheaffer, Hawthorne, and James A. Noblet, Gardena, both of Calif., assignors to The Aerospace Corporation, El Segundo, Calif.

Filed Mar. 9, 1990, Ser. No. 491,413

Int. Cl.[5] B05D *3/02, 5/06;* B32B *31/12;* G02B *5/08*

U.S. Cl. 156—89 3 Claims

1. The process of applying a specular surface to a carbon-carbon (CC) composite substrate having an inherent micro-crack network, said process including:

a. coating the CC composite substrate with a high char yield organic polymer resin lacquer and allowing the lacquer vehicle to evaporate;

b. providing a conforming interlayer for the coated CC substrate, said interlayer being composed of a polycrystalline graphite (PCG) having a tough, fine-grain structure;

c. coating the interlayer with a high char yield organic polymer resin lacquer and allowing the lacquer vehicle to evaporate;

d. abutting the coated surfaces of the CC composite substrate and the interlayer under pressure and curing the polymer coatings, followed by pyrolysis to provide a carbonaceous mechanical bond between the CC composite substrate and the interlayer;

e. applying a high char yield organic resin lacquer coating to an exposed surface of the interlayer, drying the coating and pyrolyzing the residual organic resin to form a glassy carbon specular surface on the interlayer.

5,024,711

METHOD FOR PREPARING A SUBSTRATE SURFACE FOR BONDING WITH A SYNTHETIC RESIN BY APPLYING A LAYER BY SAND BLASTING

Oswald Gasser; Rainer Guggenberger, both of Seefeld, and Bernd Burger, Alling, all of Fed. Rep. of Germany, assignors to Thera, Starnberg, Fed. Rep. of Germany

Filed Jan. 24, 1989, Ser. No. 301,019

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1988, 3802042

Int. Cl.[5] B24C *1/00*

U.S. Cl. 156—153 23 Claims

1. A method for preparing a substrate surface for bonding with a synthetic resin which comprises:

applying a coupling layer on said substrate by sand blasting with a composition which, based on the weight of the entire sand blasting composition, comprises:

(A) 0.01 to 90% by weight of an optionally silanized material having a particle size less than 5 μm and having a hardness exceeding that of the substrate surface, or

(B) 20 to 100% by weight of a silanized siliceous material having an average particle size of about 2 to 200 μm, wherein

(C) any remainder of the sand blasting composition, if present, has an average particle size greater than 5 μm, and thereafter, optionally silanizing said coupling layer.

5,024,712

PROCESS AND MACHINE FOR MANUFACTURING TUBULAR PIECES FROM AT LEAST ONE WEB OF SUPPLE MATERIAL AND TUBULAR PIECES THUS OBTAINED

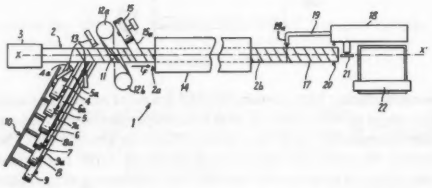
Guy Lecourt, Vauhallan, and Jacques Riou, Verrueres le Buisson, both of France, assignors to Aerospatiale Societe Nationale Industrielle, Paris, France

Continuation of Ser. No. 261,905, Oct. 25, 1988, abandoned. This application May 7, 1990, Ser. No. 520,122

Claims priority, application France, Nov. 3, 1987, 8715229

Int. Cl.[5] B31C *13/00;* B65H *81/00*

U.S. Cl. 156—184 11 Claims



1. A process for manufacturing a tubular composite, comprising the steps of:

(a) helically winding on a mandrel at least one web of material which does not adhere to said mandrel to form a tubular support layer on the mandrel;

(b) helically winding on said tubular support layer at least one separator film for forming a tubular separation layer superimposed on the support layer;

(c) helically winding on said tubular separation layer at least one web of a composite material comprising a fiber fabric impregnated with a polymerizable resin for forming a tubular composite layer;

(d) driving and compacting said tubular support layer, said tubular separation layer and said tubular composite layer parallel to the longitudinal axis of said mandrel by a friction drive means;

(e) adjusting the temperature of said polymerizable resin in a zone of said friction drive means so as to avoid transfer of said polymerizable resin on said drive means without substantial curing of said polymerizable resin, and to allow compacting of said composite layer by said drive means to form a tubular composite;

(f) curing said polymerizable resin downstream of said friction drive means;

(g) cutting said tubular composite into a desired length; and

(h) separating said tubular support layer and said tubular separation layer from said tubular composite layer.

5,024,713

METHOD OF APPLYING ORNAMENTAL ELEMENT WITH A SHAFT OF MELT ADHESIVE

Burkhart Buchbauer, Wattens, Austria, assignor to D. Swarovski & Co., Wattens, Austria

Continuation of Ser. No. 164,179, Mar. 4, 1988, abandoned. This application Sep. 13, 1989, Ser. No. 406,765

Int. Cl.[5] A44B *1/18;* C09J *5/02;* B32B *31/20*

U.S. Cl. 156—221 5 Claims

1. A method for applying ornamental elements, comprising the steps of:

providing an ornamental element having a back side, and including a shaft of melt adhesive secured to said ornamental element back side, wherein a diameter of said melt adhesive shaft is of approximately the same size as a diameter of said ornamental element back side,

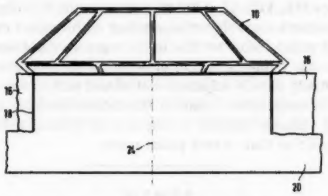
providing a perforated application material having a front side and a back side,

passing through a perforation of the application material said

shaft of melt adhesive provided on the ornamental element,

supplying heat to the shaft to soften the melt adhesive,

forming the softened shaft by pressure into a flange on the



back side of the application material wherein said step of forming the softened shaft into a flange continues until the flange has a diameter larger than a diameter of said ornamental element, and

allowing the melt adhesive to cool.

5,024,714

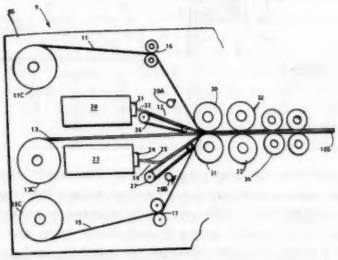
METHOD AND APPARATUS FOR FORMING A COMPOSITE MATERIAL

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Filed Jul. 10, 1985, Ser. No. 753,726

Int. Cl.[5] B29C *47/06;* **B32B** *31/20*

U.S. Cl. 156—243 **6 Claims**



1. A method of forming a composite structural member comprising:

(a) continuously feeding first, second and third sheets of metal from respective supplies thereof in a given direction whereby said first and third sheets are guided along respective converging paths in a given direction towards said second sheet which is disposed between said first and third sheets and said three sheets are driven at substantially the same speed,

(b) guiding said first and third sheets along paths which extend substantially parallel to each other beyond the converging paths thereof and are space-separated from each other to account for the second sheet driven therebetween and to provide respective spacings between said first and second sheets and said second and third sheets,

(c) continuously extrusion forming first and second extrusions of plastic having sheet configurations and driving said extrusion extrusions as respective discrete formations thereof along respective converging paths to dispose each respectively between said first and second metal sheets and said second and third metal sheets at a common location between a pair of laminating rolls, and

(d) continuously driving said laminating rolls at said common location to compress said first, second and third metal sheets together with said first and second plastic extrusions disposed between said respective pairs of said sheets to form a laminated sheet-like assembly of said five sheets to provide a composite, high strength lamination of said metal and plastic sheets.

5,024,715

METHOD FOR FABRICATING SECONDARY CONTAINMENT CAPSULE FOR UNDERGROUND STORAGE TANK

Jared A. Trussler, Pismo Beach, Calif., assignor to Trusco Tank, Inc., San Luis Obispo, Calif.

Continuation of Ser. No. 099,546, Sep. 22, 1987, abandoned, which is a continuation-in-part of Ser. No. 035,412, Apr. 6, 1987, abandoned. This application Nov. 16, 1989, Ser. No. 438,539

Int. Cl.[5] B32B *31/04*

U.S. Cl. 156—245 **38 Claims**

1. A method for forming a secondary containment capsule for a primary fluid storage container, said primary container comprising first and second ends and a longitudinal middle portion, said secondary containment capsule comprising first and second halves slideably mountable over said first and second ends of said primary container such that said first and second halves of said secondary containment capsule can completely encompass said primary container, said first and second halves of said secondary containment capsule each comprising a free end, said free ends of said first and second halves abutting each other when said first and second halves are mounted on said primary container, said method comprising the steps of:

providing mold means for forming said first and second secondary containment capsule halves;

forming each of said first and second capsule halves by applying a curable plastic material to said mold means, allowing said curable plastic material to substantially cure, and removing said substantially cured capsule halves from said mold means;

applying a texturizing agent to the inner surfaces of said first and said second capsule halves subsequent to said formation of said capsule halves, said texturizing agent including a mixture of a binder and solid particles for creating interstices that enhance fluid migration between the inner surfaces of said capsule halves and the outer surface of said primary container;

slideably mounting said first and second capsule halves over said first and second ends of said primary container such that said first and second halves abut each other and completely encompass said primary container; and

applying a curable plastic material over said abutting ends of said first and second halves.

5,024,716

PLASMA PROCESSING APPARATUS FOR ETCHING, ASHING AND FILM-FORMATION

Yasue Sato, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 298,362, Jan. 18, 1989, abandoned. This application Jan. 12, 1990, Ser. No. 464,592

Claims priority, application Japan, Jan. 20, 1988, 63-10081; Jan. 20, 1988, 63-10082

Int. Cl.[5] B44C *1/22;* **B05B** *5/025;* **B05C** *5/02;* **C23C** *14/00*

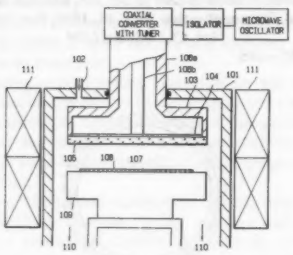
U.S. Cl. 156—345 **7 Claims**

1. A plasma processing apparatus comprising:

a vacuum vessel defining a discharge chamber, provided at

least with source gas supply means for supplying a source gas into the discharge chamber, magnetic field creating means, and microwave propagating and introducing means for propagating a microwave generated by a microwave oscillator and introducing the same into the discharge chamber;

characterized in that the microwave propagating and introducing means is encased in a conductive housing, microwave directing means is provided in a propagation path extending from the microwave oscillator to direct the



microwave so that the microwave travels from the periphery of a microwave transmission window toward the center of the same, a microwave radiating member having a cut and formed in the shape of a flat plate is attached to the surface of the microwave transmission window exposed to the discharge chamber so that the microwave traveling from the periphery toward the center of the microwave transmission window is radiated completely into the discharge chamber before reaching the center of the microwave transmission window.

5,024,717

LABELLING APPARATUS

Horst Winter, Neutraubling, Fed. Rep. of Germany, assignor to Krones AG Hermann Kronseder Maschinenfabrik, Bohmerwaldstr, Fed. Rep. of Germany

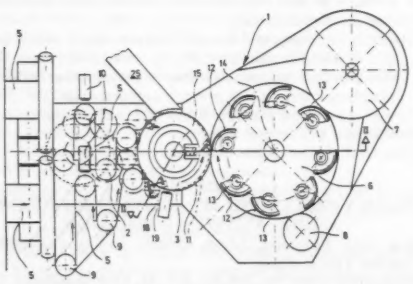
PCT No. PCT/EP88/00573, § 371 Date Nov. 30, 1989, § 102(e) Date Nov. 30, 1989, PCT Pub. No. WO89/00133, PCT Pub. Date Jan. 12, 1989

PCT Filed Jun. 30, 1988, Ser. No. 449,884

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1987, 3722220; Jun. 22, 1988, 8808030

Int. Cl.[5] B26D *5/00;* **B32B** *31/00*

U.S. Cl. 156—354 **17 Claims**



1. A labelling apparatus for affixing labels to containers, wherein the labels are supplied as a strip material (**5, 50, 500**), said label strip being supplied to the cutting cylinder or vacuum cylinder, respectively, by a feeding mechanism having a controllable drive mechanism (**9, 90**), including a cutting mechanism for separating individual labels from said label strip, and a pallet rotor (**6, 60, 600**) provided with adhesion surfaces for receiving separated individual labels thereon, characterized in that

said cutting mechanism is composed of a stationary knife (**19, 190**) and a vacuum cylinder (**3, 30, 300**) equipped with revolving blades (**51, 401**), that the circumferential surfaces (**11, 110; 12, 120**) of said vacuum cylinder are disposed at a variable radial spacing with respect to those of said pallet rotor, so that in the operative position of said vacuum cylinder its circumferential surface extends tangentially closely adjacent that of said pallet rotor, and that in an inoperative position the circumferential surface of said vacuum cylinder is disposed at a radial spacing with respect to that of said pallet rotor.

5,024,718

LABEL APPLYING APPARATUS

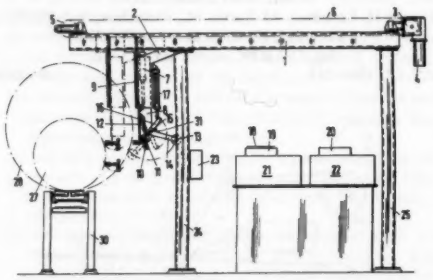
Jakob Hannen, Willich, Fed. Rep. of Germany, assignor to Kleinewefers GmbH, Krefeld, Fed. Rep. of Germany

Filed Oct. 13, 1989, Ser. No. 421,539

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1988, 3835407

Int. Cl.[5] B65C *9/12, 9/26, 9/30*

U.S. Cl. 156—475 **22 Claims**



1. Apparatus for applying labels to stationary objects at a labelling station, comprising a carrier; means for transporting said carrier between different levels relative to as well as substantially horizontally toward and away from the labelling station; a label supplying device mounted on said carrier and including means for releasably holding a label during transport of said carrier toward the labelling station; a label applying device mounted on said carrier and having means for pressing a label against the stationary object at the labelling station during transport of said carrier between different levels so that said pressing means moves along the label while exerting a force on the same, said transporting means including means for moving said carrier in a first direction and then in a second direction while said pressing means bears against the label; and means for moving at least one of said devices relative to the other of said devices.

5,024,719

CONTINUOUS STAMPING MACHINE

Ernst Heck, Echandens, and Jean Horisberger, Ecublens, both of Switzerland, assignors to Nestec S. A., Vevey, Switzerland

Continuation of Ser. No. 73,493, Jul. 15, 1987, abandoned. This application Jan. 9, 1989, Ser. No. 296,409

Claims priority, application Switzerland, Aug. 7, 1986, 3178/86

Int. Cl.[5] B32B *31/00, 31/04*

U.S. Cl. 156—522 **11 Claims**

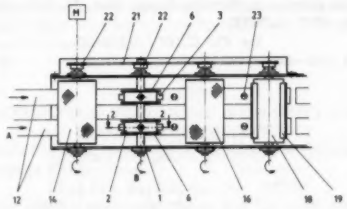
1. A machine for continuously stamping at least one advancing product strip comprising:

a table having a stationary surface for supporting at least one product strip advancing in contact therewith;

at least one stamping wheel affixed to a rotatable shaft posi-

tioned above the surface of the table such that the shaft has a longitudinal axis perpendicular to a cross section of an outer circumference of each stamping wheel which, in turn, defines a plane perpendicular to a plane of the surface of the table, each stamping wheel having about its outer circumference at least one stamping die which is capable of being heated and being positioned for contacting the at least one stamping die with a product strip to be stamped advancing on the surface of the supporting table for stamping the advancing product strip;

a first pair of rollers, each roller being affixed to a rotatable shaft and being displaced vertically one from another and positioned upstream of the stamping wheel and table, for



positioning at least one product strip to be stamped on the surface of the table for stamping;

a second pair of rollers, each roller being affixed to a rotatable shaft and being displaced vertically one from another and positioned downstream from the stamping wheel for receiving from the surface of the table at least one stamped product strip and for delivering each stamped product strip for being cut; and

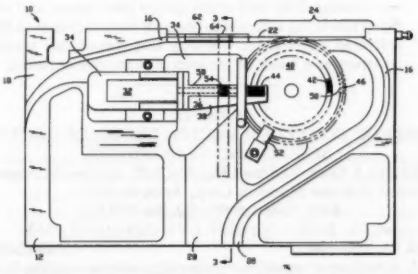
a driving motor connected with the stamping wheel shaft and the roller shafts of the first and second pairs of rollers for driving the shafts for driving the stamping wheel and the pairs of rollers in synchronism at a peripheral speed equal to a linear speed of advance of the product strip.

5,024,720

FEEDING APPARATUS FOR FEEDING BELTED COMPONENTS TO AN AUTOMATIC ASSEMBLY APPARATUS

Ernst Boss, Langenthal; Andreas R. Dill, Riedholzplatz, and Heinz Zimmermann, Aetigkofen, all of Switzerland, assignors to Zevatech AG, Roemerstrasse, Switzerland

Filed Nov. 8, 1989, Ser. No. 433,486
Int. Cl.[5] B65H *5/28*
U.S. Cl. 156—584 **6 Claims**



1. A feeding apparatus for feeding components supported on a belt and packaged in a cover tape to an automatic component assembly means, including a component insertion apparatus, said feeding apparatus comprising:

a flat housing having at least two lateral surfaces mounted on said component insertion apparatus in vertical orientation including a guiding channel for guiding the belt containing the components to be fed, said guiding channel comprising a channel portion running horizontally along an upper edge of said housing and having a freely exposed component pick-up area;

driving means for stepwise forwarding said belt containing said components to be fed through said guiding channel, said driving means mounted in the interior of said housing and including a driving motor;

means for peeling off the cover tape from said belt containing said components to be fed;

said driving motor comprising a drive shaft running parallel to the lateral surfaces of said housing;

a first power transmission means fixed to said drive shaft and adapted to stepwise forward said belt;

a second power transmission means fixed to said drive shaft and adapted to forward said cover tape when it is peeled off from said belt containing said components, to be fed;

said means for peeling off said cover tape comprising a deflection means having an oblique deflection edge located in said horizontally running portion of said guiding channel, and further having a deflection pulley with a horizontally extending rotation shaft;

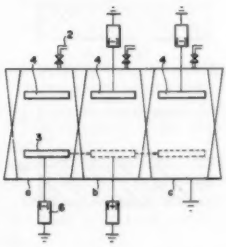
said cover tape of said belt containing said components to be fed being peeled off from said belt over said deflection edge in a horizontal direction and perpendicularly to the forwarding direction of said belt and running over said deflection pulley to be removed in a downward direction.

5,024,721

METHOD OF FORMING METAL SURFACE THIN FILM HAVING HIGH CORROSION RESISTANCE AND HIGH ADHESION

Hiroshi Yamagata, Tateyama, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Aug. 10, 1990, Ser. No. 565,556
Claims priority, application Japan, Aug. 24, 1989, 1-216011
Int. Cl.[5] B44C *1/22*; C23F *1/00*; C23C *14/00, 14/32*
U.S. Cl. 156—643 **1 Claim**



1. A method of forming a metal surface thin film having high corrosion resistance and high adhesion by carrying out sequentially the following steps a) through c):

a) an etching step carried out by applying a negative D.C. voltage to a metal substrate inside an apparatus having an inert gas atmosphere;

b) an oxide film formation step for forming an oxide film by generating an oxygen plasma inside an apparatus having an oxygen gas atmosphere and applying a positive voltage to the surface of said metal substrate; and

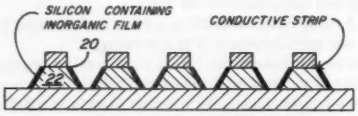
c) a durable film formation step for forming a durable film by vapor phase deposition of a corrosion-resistant material onto the surface of said metal substrate inside said apparatus having an inert gas atmosphere.

5,024,722

PROCESS FOR FABRICATING CONDUCTORS USED FOR INTEGRATED CIRCUIT CONNECTIONS AND THE LIKE

David A. Cathey, Jr., Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed Jun. 12, 1990, Ser. No. 536,733
Int. Cl.[5] B44C 1/22; C23F 1/02; H01L 21/306
U.S. Cl. 156—643 7 Claims



1. A process for fabricating metal conductors useful in integrated circuit construction which comprises the steps of:

a. depositing an etch mask on the surface of a selected metal substrate or layer,

b. dry etching the surfaces of said metal layer or substrate exposed by said etch mask in the presence of silicon tetrabromide, $SiBr_4$, and simultaneously

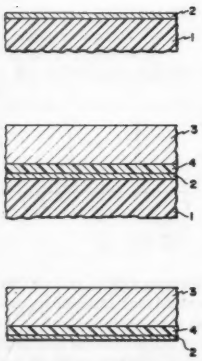
c. depositing a silicon-containing inorganic material on the side walls of metal conductors thus formed in the above etching process to thereby provide sidewall protection of said conductors and retard the horizontal etching or lateral undercutting thereof.

5,024,723

METHOD OF PRODUCING A THIN SILICON ON INSULATOR LAYER BY WAFER BONDING AND CHEMICAL THINNING

Ulrich M. Goesele, 3008 Eubanks Rd., Durham, N.C. 27707, and Volker E. Lehmann, Zweitorstr. 91 D-406, Viersen 1, Fed. Rep. of Germany

Filed May 7, 1990, Ser. No. 519,941
Int. Cl.[5] H01L 21/306; B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 156—628 17 Claims



1. A method of forming a thin silicon layer upon which semiconductor devices can subsequently be formed, comprising the steps of:

implanting carbon ions into a silicon substrate, to form an implanted layer;

bonding said silicon substrate to a mechanical support, to form a bonded wafer pair, such that the said implanted layer is adjacent said mechanical support;

annealing of said bonded wafer pair at such low temperatures that carbon remains in solid solution in silicon and no buried layer of silicon carbide is formed;

removing said silicon substrate without removing the implanted layer;

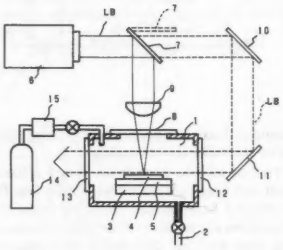
whereby said underlaying implanted layer remain on said mechanical support to form the thin silicon layer.

5,024,724

DRY-ETCHING METHOD

Yutaka Hirono; Seiichi Kiyama, both of Neyagawa, and Masato Osumi, Osaka, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Continuation of Ser. No. 172,381, Mar. 24, 1988, abandoned.
This application Oct. 16, 1989, Ser. No. 423,535
Claims priority, application Japan, Mar. 27, 1987, 62-75368; Oct. 14, 1987, 62-262224
Int. Cl.[5] C23F 1/02, 4/02
U.S. Cl. 156—643 16 Claims



1. A dry-etching method for patterning a metallic film on a substrate, the metallic surface being provided with an oxidized film, into a desired configuration, comprising the steps of:

transforming an area of said oxidized film into a transmuted portion with physical cracks that extend through said oxidized film to said metallic film by irradiating with a convergence laser beam the area of said oxidized film according to an etching pattern, said oxidized film being exposed to an atmosphere of a reactive gas reactive for transforming the area of the oxidized film which is irradiated with the laser beam; and

thereafter exposing said metallic film through said physical cracks to an atmosphere of an activated etching gas, said activated etching gas being activated by a non-convergence laser beam and effecting a complete chemical reaction with said metallic film to form a gaseous reaction end product, the step of thereafter exposing including selectively etching and removing the area of said metallic film in correspondence to said area of said oxidized film that was irradiated by said convergence laser beam, said oxidized film being resistant to removal from exposure to said activated etching gas whereby said transmuted portion collapses as a result of the step of thereafter exposing.

5,024,725

METHOD FOR SELF-INDUCTED REPAIR OF CIRCUIT SHORTS AND NEAR-SHORTS

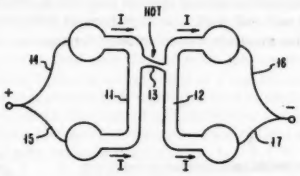
Chengjun J. Chen, Yorktown Heights, N.Y., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Feb. 6, 1990, Ser. No. 475,583
Int. Cl.[5] B44C 1/22; C23F 1/02; C03C 15/00, 25/06
U.S. Cl. 156—643 10 Claims

1. A method to repair electronic circuit shorts resulting from bridges between lines wherein said bridge is not thicker than said lines, comprising:

applying an appropriate voltage between the lines shorted by said bridge to cause said bridge temperature to be greater than the temperature of said lines and concurrently,

contacting said bridge site with a fluid capable of maintaining a heterolocalized etching process,



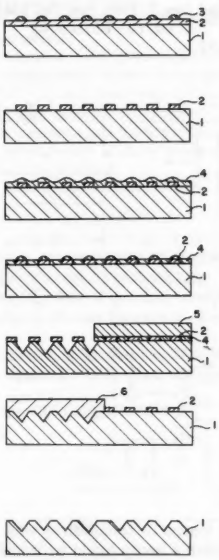
said etching continuing until a complete opening comprising a near-open between said lines is effected at the site where said bridge was broken, whereupon said method terminates automatically.

5,024,726

METHOD FOR PRODUCING A λ/4 SHIFT TYPE DIFFRACTION GRATING

Masatoshi Fujiwara, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Dec. 8, 1989, Ser. No. 447,850
Claims priority, application Japan, Feb. 27, 1989, 1-46254
Int. Cl.[5] H01L *21/308*
U.S. Cl. 156—653 **5 Claims**



1. A method for producing a diffraction grating including a ¼ wavelength shift in the grating in a substrate comprising:

depositing an electrically insulating film directly on a surface of a substrate;

depositing a first masking film on the electrically insulating film and forming the first masking film into a first grating pattern;

etching the electrically insulating film using the first grating pattern as a mask and subsequently removing the first grating pattern of the first masking film to leave a grating pattern of the electrically insulating film on the surface of the substrate;

depositing a second masking film on the surface of the substrate and on the grating pattern of the electrically insulating film, thereby burying the grating pattern of the electrically insulating film;

etching the second masking film to expose at least a portion of the grating pattern of the electrically insulating film without entirely removing the second masking film;

depositing a third masking film on the second masking film and the exposed portion of the grating pattern of the electrically insulating film;

removing the third masking film and the grating pattern of the electrically insulating film from a portion of the substrate, thereby providing a grating pattern of the second masking film on the portion of the substrate where the third masking film and the electrically insulating film is removed, and etching the substrate using the grating pattern of the second masking film and the remaining portion of the third masking film as masks to thereby form a first portion of a diffraction grating in the substrate;

removing the second and third masking films from the substrate without removing the remaining portion of the grating pattern of the electrically insulating film;

depositing a fourth masking film on the surface of the substrate and the electrically insulating film and then removing the fourth masking film from a portion of the surface of the substrate excluding the first portion of the diffraction grating, to thereby expose the remaining portion of the grating pattern of the electrically insulating film and adjacent portions of the surface of the substrate;

etching the substrate using the grating pattern of the electrically insulating film and the fourth masking film as masks to thereby form a second portion of a diffraction grating in the substrate which second portion is shifted ¼ wavelength from the first portion diffraction grating in the substrate; and

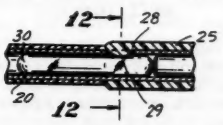
removing the remaining portions of the fourth masking film and the electrically insulating film to thereby form a ¼ wavelength shift diffraction grating.

5,024,727

METHOD OF FORMING AN ANIMAL MARKER IMPLANTING SYSTEM

Neil E. Campbell, Hasbrouch Heights, and Chinsoo Park, Rutherford, both of N.J., assignors to Bio Medic Data Systems, Inc., Maywood, N.J.

Division of Ser. No. 248,451, Sep. 23, 1988, which is a continuation-in-part of Ser. No. 919,152, Oct. 6, 1986, Pat. No. 4,787,384. This application Oct. 4, 1989, Ser. No. 417,225
Int. Cl.[5] B44C *1/22;* **C03C** *15/00, 25/06*
U.S. Cl. 156—663 **4 Claims**



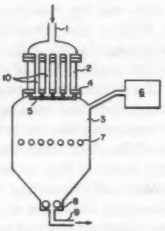
2. A method for forming an electronic transponder capsule which prevents migration within an animal comprising the steps of embedding said electronic transponder in a glass capsule; partially inserting the glass capsule into a mold cavity; injecting a resin into said mold cavity; and curing the resin about said glass capsule.

5,024,728

DEVOLATILIZATION OF LIQUID COMPOSITION CONTAINING POLYMER AND VOLATILE CONSTITUENTS

Tsuyoshi Morita; Kyotaro Shimazu, both of Chiba, and Masataka Furukawa, Koshigaya, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Filed Aug. 28, 1989, Ser. No. 399,003
Claims priority, application Japan, Aug. 29, 1988, 63-214075
Int. Cl.[5] B01D *1/06*
U.S. Cl. 159—27.4 11 Claims



1. A method of devolatilizing a liquid composition containing a styrene-based polymer and volatile constituents which comprises

feeding the liquid composition to the inlet of a vertical multi-tube heat exchanger whereby a stream of the liquid composition flows downwardly through each of the tubes of said heat exchanger to thereby raise the temperature of said liquid composition in each said stream,

subdividing each of the heat exchanged liquid streams flowing from the outlet of each of said heat exchange tubes into a plurality of subdivided liquid streams by passing each liquid stream through an apertured distributor mounted directly to the outlet end of each respective heat exchanger tube,

and volatilizing the plurality of subdivided liquid streams flowing through the apertured distributors in a first volatilization zone located below the vertical multi-tube heat exchanger and apertured distributors.

8. An apparatus for devolatilizing liquid composition containing polymer and volatile constituents comprising a vertical multi-tube heat exchanger, a volatilizer coupled to the underside of said heat exchanger and vacuum means connected to said volatilizer, and a distributor provided between said heat exchanger and said volatilizer, wherein said distributor is directly mounted on the outlet of each tube of said vertical multi-tube heat exchanger.

5,024,729

SUCTION ROLL WITH TURBULENCE SUPPRESSION ELEMENT

Antti Kuhasalo; Olavi Viitanen, and Heikki Ilvespää, all of Jyväskylä, Finland, assignors to Valmet Paper Machinery Inc., Finland

Filed Aug. 14, 1990, Ser. No. 567,106
Claims priority, application Finland, Aug. 18, 1989, 893893
Int. Cl.[5] D21F *5/02*
U.S. Cl. 162—372 6 Claims

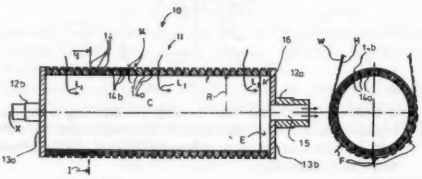
1. A suction roll comprising:

a roll shell, said roll shell comprising a plurality of recesses, each recess having a plurality of holes therein through which holes air is sucked to press a paper web toward the outer surface of the roll shell;

a pair of journals about which said roll shell is rotatable;

said suction roll having an internal space within said roll shell with no suction box therein and in which suction roll a suction condition is created by an external suction device directly connected to one of said journals;

an air turbulence suppression element connected to an end of said roll shell which is in proximity to said one journal directly connected to said external suction device, said turbulence suppression element comprising at least one shell member whose surface extends perpendicularly to the longitudinal axis of the roll and which directs air flow within said roll shell so as to reduce air turbulence therein and thus maintain a substantially constant suction condi-



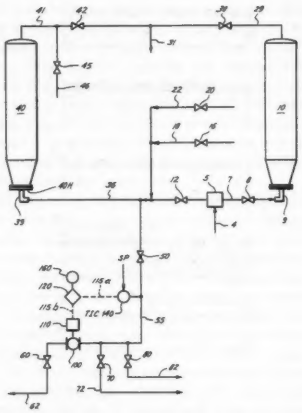
tion along the inner surface of said roll shell throughout its entire width and to maintain a substantially constant flow of suction air through said recesses of said roll shell, said suction roll and device being arranged so that said suction condition is applied over the entire inner surface of the roll shell.

5,024,730

CONTROL SYSTEM FOR DELAYED COKER

James H. Colvert, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Jun. 7, 1990, Ser. No. 534,808
Int. Cl.[5] B01D *3/42*
U.S. Cl. 196—132 3 Claims



3. A control system in combination with a delayed coker apparatus in which a heavy liquid hydrocarbon feedstock is converted to solid coke and fluid hydrocarbons in a coke drum and from which coke drum coke, fluid hydrocarbons and water are removed, said coker apparatus comprising:

the coke drum,

a manifold connected to said coke drum,

a coker fractionator conduit connected to said manifold for providing the flow of fluids from said manifold to a coker fractionator,

said control system comprising, a temperature sensor and transmitter positioned to sense the temperature of fluids in said manifold and to transmit a temperature signal corresponding thereto,

a valve means positioned to regulate fluid flow in said coker fractionator conduit,

a valve actuator being operable to adjust said valve means between fully open and fully closed positions,

comparing means for receiving a set point temperature and said temperature signal, being operable to impress a comparing means signal into said valve actuator for activating said valve means to the fully closed position in response to a temperature less than said set point temperature,

said set point temperature selected at a temperature above the temperature at which water can exist in the liquid state in the manifold, the control system thereby preventing the flow of liquid water into the coker fractionator by way of the coker fractionator conduit.

5,024,731

METHOD OF MANUFACTURING MATERIAL FOR MEDICAL AND PHARMACEUTICAL PRODUCTS FROM PYROLIGNEOUS ACID

Katsumi Nagata, 10-18, Iwaidani 4-chome, Matsuyama-shi, Ehime-ken, and Hisako Nagata, 2-10, Kyoyama 1-chome, Okayama-shi, Okayama-ken, both of Japan

Filed Nov. 29, 1989, Ser. No. 442,990

Claims priority, application Japan, Nov. 29, 1988, 63-302009

Int. Cl.[5] B01D *3/00;* **C07C** *51/42*

U.S. Cl. 203—99 **1 Claim**

1. A method of manufacturing a purified pyroligneous acid for medical and pharmaceutical products from a pyroligneous acid material consisting essentially of the steps of

heating trees and barks at a temperature sufficient to produce a smoke containing water in which said water comprises pyroligneous acid therein;

cooling the smoke to liquify the water containing pyroligneous acid in said smoke;

heating said pyroligneous acid, extracting resultant evaporation gas at a temperature within the range consisting of from 98° to 103° C.; and liquifying said extracted gas by cooling, such that noxious components comprising of formaldehyde, methanol and 3,4 benzyprene are avoided, and purified pyroligneous acid for medical and pharmaceutical products is obtained.

5,024,732

METHOD OF AND DEVICE FOR COMPENSATING VARIATIONS OF BRANCH CURRENTS IN ELECTROPLATING BATHS

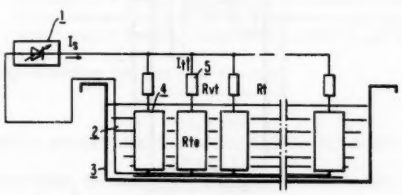
Egon Hübel, Feucht, Fed. Rep. of Germany, assignor to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Sep. 7, 1988, Ser. No. 241,595

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1987, 3732476

Int. Cl.[5] C25D *21/12, 5/18*

U.S. Cl. 204—1.11 **10 Claims**



1. A method of compensating operational variations of nominal branch currents in a circuit for electroplating a plurality of articles, the circuit including an electrolytic bath in which the articles and corresponding anode plates are immersed, a source of total electroplating current having its positive electrode connected to an anode bus bar for supporting the anode plates and its negative electrode connected to cathode bus bar for supporting the articles, the method comprising the steps of connecting in series with each electroplating branch circuit a passive compensating resistor R_{vt} whose value exceeds the range of operation dependent electrolyte resistance R_{te} of the corresponding branch circuit, and adjusting the total current I_t from said source to the sum of nominal operation dependent branch currents I_t of said branch circuits.

5,024,733

PALLADIUM ALLOY ELECTROPLATING PROCESS

Joseph A. Abys, Warren, and Heinrich K. Straschil, Summit, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 400,202, Aug. 29, 1989, abandoned. This application May 11, 1990, Ser. No. 523,290

Int. Cl.[5] C25D *3/56*

U.S. Cl. 204—3 **11 Claims**

1. A process of electroplating a metallic substance onto a surface, said metallic substance comprising palladium and arsenic, said process comprising the step of passing current through a cathode, an electroplating bath and an anode, said electroplating bath comprising a source of palladium and a source of arsenic and having an electrical conductivity greater than 10^{-3} mho-cm and pH greater than 7, said source of palladium comprises a palladium complex ion with a complexing agent selected from the group consisting of ammonia, diaminopropane, 1,4-diamino butane, 1,6-diaminohexane, and 2-hydroxyl-1,3-diaminopropane, said source of arsenic is selected from the group consisting of As_2O_3, As_2O_5, KH_2AsO_4, K_2HAsO_4, K_3AsO_4, NaH_2AsO_4, Na_2HAsO_4, Na_3AsO_4, K_3AsO_3, $KAsO_2$, Na_3AsO_3, $NaAsO_2$ and $Na_4As_2O_7$, said electroplating bath having a palladium concentration of from 0.005 to 1.0 molar, and an arsenic concentration of from 0.01 molar to 0.1 molar.

5,024,734

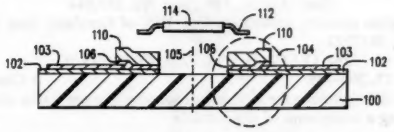
SOLDER PAD/CIRCUIT TRACE INTERFACE AND A METHOD FOR GENERATING THE SAME

Walter M. Downs, Lutherville, and Michael J. Ankrom, Baltimore, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 27, 1989, Ser. No. 457,421

Int. Cl.[5] C25D *5/02, 5/48, 5/10;* **B05D** *5/12*

U.S. Cl. 204—15 **8 Claims**



1. A method of precisely depositing, upon a PWB, closely-spaced circuit traces and closely-spaced solder pads which are electrically connected to the traces and of a greater thickness than the traces such that during a solder reflow operation the solder will not migrate from the pad onto the circuit traces, the method comprising the steps of:

a) depositing circuit traces of a single component metal of nickel having a melting point greater than that of the solder and which is poorly wettable to the solder upon a conductive base layer on a dielectric substrate with a portion of each trace overlapping an area on the base layer onto which a solder pad for the lead of an electrical component is to be located;

b) activating the overlapping portion of each metal circuit trace;

c) depositing an intermediate layer of metal, which is wettable to both the trace metal and the solder, within the pad area at least upon the overlapping portion of each metal circuit trace;

d) depositing solder over each intermediate layer of metal to

a predetermined thickness greater than the thickness of the circuit trace and;

e) selectively removing portions of the conductive base layer adjacent to the circuit traces such that the circuit traces are not electrically interconnected by the base layer.

5,024,735

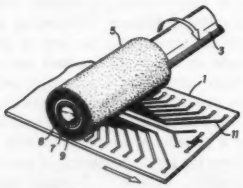
METHOD AND APPARATUS FOR MANUFACTURING INTERCONNECTS WITH FINE LINES AND SPACING

Igor V. Kadija, 118 Sherwood Rd., Ridgewood, N.J. 07450

Filed Feb. 15, 1989, Ser. No. 311,212

Int. Cl.[5] C25D *5/02*; C25F *3/14*

U.S. Cl. 204—15 **19 Claims**



1. The method of making fine line and spacing interconnects comprising the steps of:

applying an electrolyte to an imaged substrate;

applying electricity to said imaged substrate via said electrolyte by contacting said substrate with an electrically conductive brush; and

moving said brush in a vibratory motion relative to the plane of said imaged substrate.

5,024,736

PROCESS FOR ELECTROPLATING UTILIZING DISUBSTITUTED ETHANE SULFONIC COMPOUNDS AS ELECTROPLATING AUXILIARIES AND ELECTROPLATING AUXILIARIES CONTAINING SAME

Wolfgang Clauss, Neustadt; Werner Kurze, Neuhofen; Ferdinand Leifeld, Ludwigshafen, and Willy Wassenberg, Neuhofen, all of Fed. Rep. of Germany, assignors to Raschig AG, Ludwigshafen, Fed. Rep. of Germany

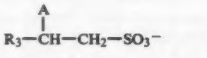
Filed May 24, 1989, Ser. No. 357,044

Claims priority, application Fed. Rep. of Germany, May 25, 1988, 3817722

Int. Cl.[5] C25D *3/12, 3/38*; C07D *213/00*

U.S. Cl. 204—49 **3 Claims**

1. A brightener for acid electroplating copper baths comprising a compound of the formula



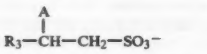
or an alkali or an ammonium salt thereof, wherein,

A represents a mercapto radical of the formula - S - R_4, in which R_4 is hydrogen and

R_3 represents an alkyl group having 1 to 4 carbon atoms.

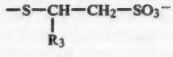
2. A process for electroplating, comprising the step of:

adding to a nickel electroplating bath, a compound of the formula



or an alkali or an ammonium salt thereof, wherein,

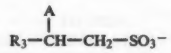
A represents a mercapto radical of the formula -S-R_4, in which R_4 denotes a substituent selected from the group consisting of hydrogen and the group:



R_3 represents an alkyl group having 1 to 4 carbon atoms said compound, or said alkali salt or said ammonium salt thereof, being an electroplating auxiliary.

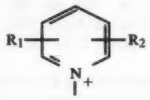
3. A process for electroplating, comprising the step of:

adding to a copper electroplating bath, a compound of the formula



or an alkali or an ammonium salt thereof, wherein,

A represents a pyridinium radical



in which R_1 and R_2 independently denote hydrogen or an alkyl radical having 1 to 3 carbon atoms, R_1 and R_2 together with a pyridinium radical form a condensed six-membered aromatic ring,

R_3 represents an alkyl group having 1 to 4 carbon atoms said compound, or said alkali salt or said ammonium salt thereof, being an electroplating auxiliary.

5,024,737

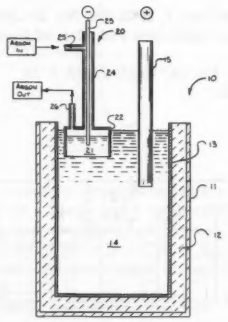
PROCESS FOR PRODUCING A REACTIVE METAL-MAGNESIUM ALLOY

Kenneth G. Claus; Dwaine W. Schoppe, and Matthew R. Earlam, all of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 9, 1989, Ser. No. 364,771

Int. Cl.[5] C25C *3/36*

U.S. Cl. 204—71 **14 Claims**



6. A process for producing a molten alloy of magnesium and a reactive metal said reactive metal being produced by electrolysis of a molten salt bath comprising the chloride of calcium, lithium, sodium, or potassium, wherein the said alloy is formed in a molten magnesium cathode,

said process comprising providing a molten magnesium metal cathode in said molten bath; electrolyzing a molten halide salt bath containing the chloride salt of the reactive

metal, whereby said reactive metal produced by the electrolysis is deposited in said molten magnesiun cathode and alloys therewith; and removing the molten alloy from said bath,

and wherein the process is operated using an electrical element comprising a solid magnesium rod enclosed in a tube made of an inert material and cooled by an inert gas, said element being in electrical contact with the molten magnesium cathode.

5,024,738

RECOVERY OF MERCURY FROM MERCURY COMPOUNDS VIA ELECTROLYTIC METHODS

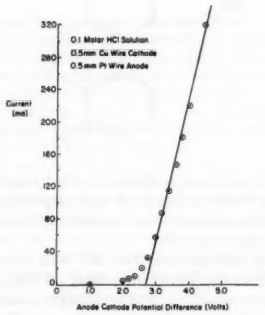
Mark W. Grossman, Belmont, and William A. George, Rockport, both of Mass., assignors to GTE Products Corporation, Danvers, Mass.

Continuation of Ser. No. 259,425, Oct. 7, 1988, Pat. No. 4,879,010, which is a continuation of Ser. No. 815,150, Dec. 31, 1985, abandoned. This application Aug. 18, 1989, Ser. No. 395,867

The portion of the term of this patent subsequent to Dec. 16, 2003, has been disclaimed.

Int. Cl.[5] C25C *1/16*

U.S. Cl. 204—105 R **6 Claims**



1. A process for electrolytically recovering Hg from Hg_2Cl_2 which comprises:

(a) forming an electrolyte solution, said electrolyte solutions comprising concentrated HCl and H_2O;

(b) adding Hg_2Cl_2 to said electrolyte solution, said Hg_2Cl_2 dissolving in said electrolyte solution such that mercurous ions are formed in solution;

(c) placing an anode and a cathode into the electrolye solution;

(d) applying an electric voltage across said anode and cathode, thus, passing an electrode current from the anode through the electrolyte solution to the cathode whereby the mercurous ions in the electrolyte solution are reduced and elemental mercury plates onto the cathode; and thereafter

(e) recovering said elemental mercury.

5,024,739

NOVEL HYBRID ISOTOPE SEPARATION SCHEME AND APPARATUS

Jakob Maya, Brookline, Mass., assignor to GTE Products Corporation, Danvers, Mass.

Filed Mar. 15, 1989, Ser. No. 323,920

Int. Cl.[5] B01D *5/00*

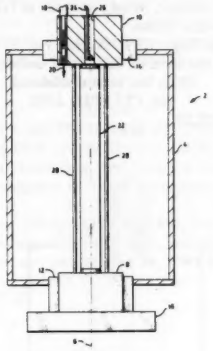
U.S. Cl. 204—157.2 **21 Claims**

1. A method of yielding selectively a desired enrichment in a specific isotope comprising the steps of:

inputting into a rotatable chamber a gaseous mixture including said specific isotope;

spinning said chamber and said gaseous mixture therein;

radiating said spinning gaseous mixture with frequencies characteristic of the absorption and ionization of said specific isotope of the atomic or molecular gas in said gaseous mixture, thereby ionizing the specific isotope and



collecting the ionized specific isotope from said spinning and radiated gaseous mixture.

5,024,740

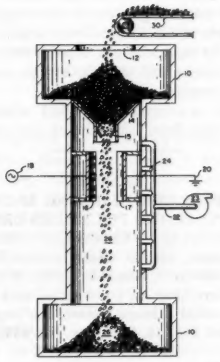
MINERAL REFINEMENT BY HIGH RF ENERGY APPLICATION

Stephen M. Birken, 23 Mohawk Trail, and Karl Birken, 38 Grant Hill Ct., both of Clifton Park, N.Y. 12065

Continuation of Ser. No. 125,938, Nov. 27, 1987. This application Oct. 28, 1989, Ser. No. 423,142

Int. Cl.[5] C01G *23/00*; C22B *1/00*

U.S. Cl. 204—157.15 **6 Claims**



1. A method for refining a base material by selectively removing inclusions therefrom, said method consisting of the steps of:

transporting said base material through a confinement apparatus, in an atmosphere characterized by the absence of air, said transporting providing determinable amounts of said base material to pass through said confinement means;

irradiating, simultaneously with said transporting and at predetermined frequencies, said base material with alternating RF energy of sufficient power to selectively vaporize a particular inclusion to thus free it from said base material; and

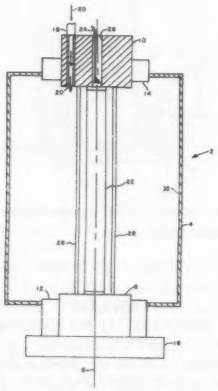
removing immediately thereafter said irradiating step, any vaporized inclusion matter by suitable means.

5,024,741

HYBRID ISOTOPE SEPARATION SCHEME

Jakob Maya, Brookline, Mass., assignor to GTE Products Corporation, Danvers, Mass.

Filed Mar. 15, 1989, Ser. No. 323,930
The portion of the term of this patent subsequent to Jun. 18, 2008, has been disclaimed.
Int. Cl.[5] B01D *5/00*
U.S. Cl. 204—157.22 22 Claims



1. A method of yielding selectively a desired enrichment in a specific isotope comprising the steps of:

inputting into a rotatable chamber a gas comprising a gaseous mixture including said specific isotope and a scavenger from which said specific isotope is to be isolated;

spinning said chamber and said gas therein;

radiating said spinning gas with a wave length or frequency characteristic of the absorption of a particular isotope of the atomic or molecular gas, thereby inducing a chemical reaction between said specific isotope and scavenger to form a scavenger compound; and

collecting the scavenger compound which includes the specific isotope from said spinning and radiated gas.

5,024,742

METHOD OF CROSSLINKING AMINO ACID CONTAINING POLYMERS USING PHOTOACTIVATABLE CHEMICAL CROSSLINKERS

Anthony B. Nesburn, Malibu, Calif.; Michael Gorin, Rockville, Md.; Marvin Martinez, Glendale, Calif.; M. Cristina Kenney, Malibu, and Ezra Maguen, Los Angeles, both of Calif., assignors to Cedars-Sinai Medical Center, Los Angeles, Calif.

Filed Feb. 24, 1988, Ser. No. 159,603
Int. Cl.[5] B05D *3/06*
U.S. Cl. 204—157.68 21 Claims

1. A method of crosslinking amino acid containing polymers unto themselves for in vivo applications by means of photoactivatable heterobifunctional crosslinking agents, said crosslinking agents have a photoactivatable site and a conventional site, which comprises:

(a) selecting the amino acid containing polymers;

(b) combining said amino acid containing polymers with said photoactivatable heterobifunctional crosslinking agents such that the conventional site on the crosslinking agent is bound to the polymer, and the other photoactivatable site on the crosslinking agent is unbound, photoactivating the crosslinked polymer to bind to another amino acid containing polymer, thereby forming a crosslinked amino acid containing polymer for in vivo application.

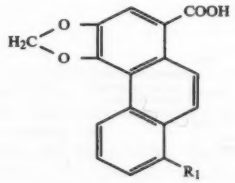
5,024,743

METHYLENDIOXYPHENATHRENE AND STILBEN DERIVATIVES, PROCESS FOR THE PREPARATION THEREOF, PHARMACEUTICAL COMPOSITIONS USING THESE, AND THERAPEUTIC APPLICATIONS

Klaus Görler, Bergisch Gladbach; Günter Krumbiegel, Bergheim-Quadrat; Michael Hanack, Tubingen, and Lakshmina R. Subramanian, Gomaringen, all of Fed. Rep. of Germany, assignors to Madaus GmbH & Co., Cologne, Fed. Rep. of Germany

Division of Ser. No. 227,496, Aug. 1, 1988, abandoned, which is a continuation of Ser. No. 900,823, Aug. 27, 1986, abandoned.
This application Dec. 27, 1989, Ser. No. 457,353
Claims priority, application Fed. Rep. of Germany, Aug. 28, 1985, 3530718
Int. Cl.[5] C07D *317/70*
U.S. Cl. 204—157.69 7 Claims

1. Process for preparation of a compound of the formula



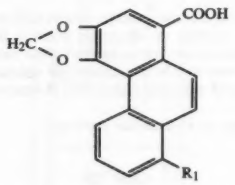
wherein R_1 is hydrogen, methoxy or ethoxy comprising:

(i) reacting 6-bromo piperonyl with triphenylphosphine in an anhydrous solvent under conditions favoring formation of a phosphonium salt,

(ii) reacting said phosphonium salt with a compound selected from the group consisting of benzaldehyde, o-methoxybenzaldehyde and o-ethoxybenzaldehyde in the presence of a strong base to produce a stilbene bromide, and

(iii) treating the stilbene bromide by either (a) reacting it with a metal cyanide in a polar aprotic solvent to form a nitrile followed by hydrolyzing said nitrile or (b) treating it with n-butyl lithium and CO_2, to form said compound.

6. Process for preparation of a compound of formula



wherein R_1 is hydrogen, methoxy or ethoxy, comprising:

(i) reacting 6-bromo piperonyl with triphenylphosphine in an anhydrous solvent under conditions favoring formation of a phosphonium salt,

(ii) reacting said phosphonium salt with a compound selected from the group consisting of benzaldehyde, o-methoxybenzaldehyde and o-ethoxybenzaldehyde in the presence of a strong base to produce a stilbene bromide, and

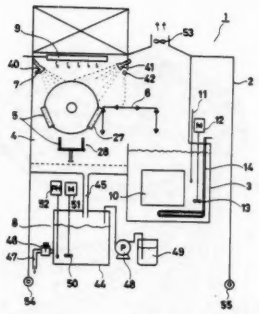
(iii) treating said stilbene bromide with ultraviolet radiation to yield said compound.

5,024,744

STAMPER CLEANING APPARATUS

Norio Okabayashi, Himeji, Japan, assignor to Daicel Chemical Industries, Ltd., Sakai, Japan

Filed Jun. 11, 1990, Ser. No. 535,839
Claims priority, application Japan, Jun. 12, 1989, 1-149229
Int. Cl.[5] C25D *7/00, 1/00;* B08B *3/00*
U.S. Cl. 204—194 11 Claims



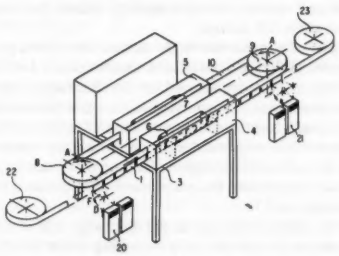
1. A stamper cleaning apparatus, comprising:
an electrocleaning tank for performing electrocleaning;
a washing room adjacent to this cleaning tank;
washing water spraying means, disposed in the upper section of the washing room, for water-washing a stamper by spraying washing water onto the stamper while the stamper is positioned inside the washing room and is wet with the electrocleaning solution;
water drain means, disposed in the lower section of the washing room, for collecting water after the stamper is washed with water and for draining the water; and
drying means, disposed in the upper section of the washing room, for operating to dry the stamper after the washing water supply means has operated during a predetermined time the stamper is held in the washing room.

5,024,745

APPARATUS FOR TREATING STRIP-SHAPED ELEMENTS

Jorg W. Rischke, Veldhoven; Peter J. G. Loermans, Bergharen, and Peter J. M. Huvenaars, Zeeland, all of Netherlands, assignors to MECO Equipment Engineers B.V., Hertogenbosch, Netherlands

Filed Jan. 30, 1990, Ser. No. 472,263
Claims priority, application Netherlands, Jan. 31, 1989, 8900229
Int. Cl.[5] C25D *17/06*
U.S. Cl. 204—198 23 Claims



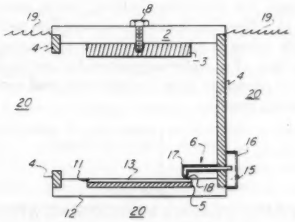
1. Apparatus for treating strip-shaped elements (1), said apparatus being provided with an endless belt (10) with resilient clamping means (14, 36, 45, 51) for clamping strip-shaped elements (1) on the endless belt (10), such that the strip-shaped elements (1) can be led through one or more treatment baths, characterized in that resilient clamping means (14, 36, 45, 51) are each connected near one end (16, 41, 50, 52) with the endless belt, and with their other free clamping end (18, 39, 46, 56) abut against the belt under the influence of their own resilience, whilst near one loading and/or unloading station the apparatus comprises means (8, 9) by means of which the free clamping ends (18, 39, 46, 56) of the clamping means can be pushed in a direction remote from the belt.

5,024,746

FIXTURE AND A METHOD FOR PLATING CONTACT BUMPS FOR INTEGRATED CIRCUITS

Roger J. Stierman, Richardson, and Robert J. Lessard, Garland, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 295,684, Jan. 10, 1989, Pat. No. 4,931,149, and a continuation-in-part of Ser. No. 37,760, Apr. 13, 1987, Pat. No. 4,861,452. This application May 14, 1990, Ser. No. 523,104
Int. Cl.[5] C25D *17/06*
U.S. Cl. 204—297 W 10 Claims



1. A bump plating fixture for minimizing the number of trapped bubbles in the vias on a wafer, comprising:
(a) a base plate;
(b) a recess in an upper face of the base plate for holding a wafer in a face up orientation; and
(c) a pad in the recess for preventing the plating bath from coming into contact with the back of the wafer and being of sufficient thickness to cause an upper face of the wafer to be coplanar with the upper face of the base plate.

5,024,747

WAFER COATING SYSTEM

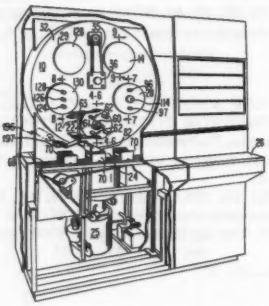
Frederick T. Turner, Sunnyvale; Martin A. Hutchinson, Santa Clara; R. H. Shaw, Palo Alto, and Lawrence T. Lamont, Jr., Mountain View, all of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Division of Ser. No. 106,343, Dec. 21, 1979, Pat. No. 4,756,815. This application Jun. 1, 1988, Ser. No. 183,013
The portion of the term of this patent subsequent to Jul. 12, 2005, has been disclaimed.
Int. Cl.[5] C23C *14/34, 14/56*
U.S. Cl. 204—298.09 17 Claims

1. Apparatus for processing semiconductor wafers held stationary during processing, said apparatus comprising:
processing chamber means comprising an entrance wall having an entrance opening for wafers;
wafer holding means inside said chamber means for holding a wafer with one face of the wafer being substantially exposed for processing;
wafer processing means offset from said entrance opening for processing a wafer supported by said wafer holding means, said processing means having a surface adapted to contact a face of a wafer;
means for moving said wafer holding means along a first path for positioning said wafer holding means selectively in alignment with one or the other of said entrance open-

ing and said processing means, said moving means including means for stopping said movement along said first path when said wafer holding means is in either of said alignment positions; and

means for causing relative movement between said process-



ing means and said wafer holding means, one toward the other, in a direction transverse to said first path when said holding means is aligned with said processing means, so that a face of a wafer supported by said wafer holding means is caused to be in contact with said surface of said processing means.

5,024,748

MICROWAVE PLASMA PROCESSING APPARATUS

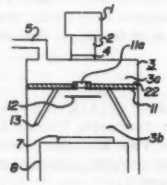
Shuzo Fujimura, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jan. 22, 1990, Ser. No. 468,459

Claims priority, application Japan, Jan. 26, 1989, 1-16901

Int. Cl.[5] C23C *14/00*

U.S. Cl. 204—298.38 **8 Claims**



1. A microwave plasma processing apparatus, comprising:

a plasma generation chamber for generating plasma by irradiating microwave power to a reactive gas introduced therein,

a reaction chamber disposed on a downstream side of the reactive gas for receiving a substrate to be processed therein,

a plasma shield plate separating the reaction chamber from the plasma generation chamber, the plasma shield plate being of electrically conductive material and having at least a hole for allowing the plasma to flow into the reaction chamber and forming a portion of the plasma generation chamber, and

a separate cover member disposed on the surface of said plasma shield plate facing the plasma generation chamber, said cover member being of a sufficient thickness to prevent cracking or peeling phenomena due to thermal stresses, and made of an inactive material with respect to the active species included in the plasma.

5,024,749

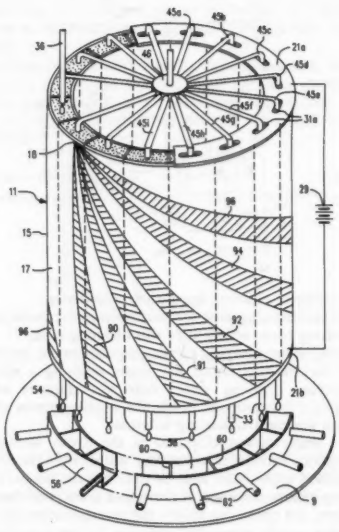
SYSTEM AND METHOD FOR CONTINUOUS SEPARATION OF ISOTOPES

Thomas S. Snyder, Oakmont; John F. Jackovitz, Monroeville Boro, and Harry M. Ferrari, Fox Chapel, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 20, 1990, Ser. No. 512,238

Int. Cl.[5] B01D *61/42, 15/08*

U.S. Cl. 204—299 R **15 Claims**



1. An isotopic separation system for continuously separating the isotopes present in a sample containing a mixture of isotopes of a chemical element in ionic form, said system comprising:

(a) rotatable annulus means having a feed end spaced axially from a discharge end for holding a plurality of circumferentially spaced separation cell means packed with a separation medium for separating said isotopes, wherein each of said separation cell means extends axially from said feed end to said discharge end;

(b) an isotope-containing sample feed source having an outlet means for introducing said sample into each of said separation cell means;

(c) an eluant source having a plurality of outlet means, wherein each said outlet means corresponds to a separation cell means, for introducing eluant into each said separation cell means;

(d) a pair of annular electrode means, one of said pair being located at the feed end of said annulus means and the other of said pair being located at the discharge end of said annulus means, for applying an electric potential axially along said annulus means and each of said separation cell means while said annulus means is rotating, thereby causing the separation of lighter isotopes from heavier isotopes in said sample and the enrichment of said eluant with said isotopes; and

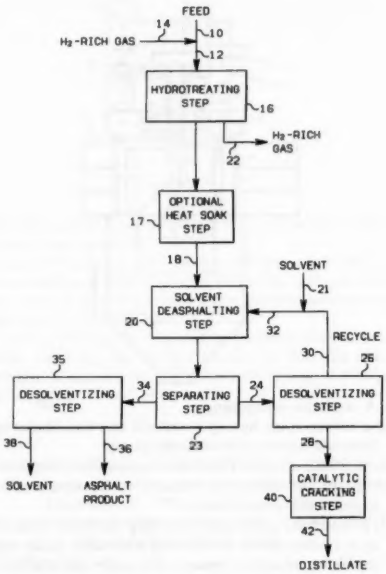
(e) drain assembly means at the discharge end of said annulus means for continuously collecting eluant enriched with one of said isotopes, including discharge outlet means associated with each said separation cell means for withdrawing isotopically enriched eluant from each said cell separation means.

5,024,750

PROCESS FOR CONVERTING HEAVY HYDROCARBON OIL

Edward L. Sughrue, II; Patricia A. Tooley; Brent J. Bertus, and Billie S. Grayson, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 26, 1989, Ser. No. 457,411
Int. Cl.[5] C10G *45/00*
U.S. Cl. 208—57 18 Claims



10. A process for treating a heavy hydrocarbon containing feed stream, which contains asphaltenes and impurity compounds of sulfur and metals, said process comprising:

(a) contacting said heavy hydrocarbon feed stream with a hydrogen-containing reactant gas in the presence of a hydrotreating catalyst having an average a pore diameter in a range of from about 40 to about 80 angstroms at conditions sufficient for removing a portion of sulfur and metal impurities from said feed stream and without substantially cracking said feed stream so as to provide an effluent having a reduced sulfur content;

(b) heating said reduced sulfur effluent under visbreaking conditions so as to lower the viscosity of said reduced sulfur effluent;

(c) thereafter contacting said reduced sulfur effluent with a solvent so as to form a mixture comprising at least two phases, wherein a first phase comprises an extract which is relatively lean in asphaltenes and metal content relative to said reduced sulfur effluent, and a second phase comprises a raffinate which is relatively rich in asphaltenes and metal content relative to said reduced sulfur effluent;

(d) separating said first phase and said second phase, and thereafter removing solvent from said first phase so as to provide an effluent stream essentially free of solvent;

(e) catalytically cracking said solvent free effluent stream, in the presence of a catalytic cracking catalyst and essentially in the absence of added hydrogen containing reactant gas so as to produce lower molecular weight hydrocarbon products.

5,024,751

CATALYTIC COMPOSITION COMPRISING A METAL SULFIDE SUSPENDED IN A LIQUID CONTAINING ASPHALTENES AND HYDROVISBREAKING PROCESS OF A HYDROCARBON CHARGE

Pierre Giuliani, Grenoble; Jean-Francois Le Page, Rueil Malmaison; Jean-Claude Plumail, Nanterre, and Marcellin Espaillac, Viroflay, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed May 18, 1989, Ser. No. 353,836
Claims priority, application France, May 19, 1988, 88 06839; May 19, 1988, 88 06840
Int. Cl.[5] C10G *47/06*
U.S. Cl. 208—108 7 Claims

1. A process for catalytic hydrovisbreaking of a hydrocarbon charge comprising the following stages:

(a) mixing the charge with a gas containing hydrogen in amount sufficient to carry out the hydrovisbreaking reaction and bringing the mixture up to a temperature of at least 330° C.,

(b) introducing into the hydrogen-hydrocarbon charge mixture an amount of a catalytic composition that is sufficient to obtain a content of metal in the charge ranging from about 10 to 2,000 ppm by weight in relation to the weight of the charge, said catalytic composition being obtained with a method comprising the following stages:

(1) subjecting to a thermal treatment at a temperature ranging from 80° to 250° C. for a duration ranging from 0.1 to 24 hours, under a globally reducing atmosphere of a gas containing hydrogen, a mixture obtained by contacting, in any order, at least one compound other than a sulfide of at least one metal of groups VI B, and VII B of the periodic table of elements, with a hydrocarbon charge containing asphaltenes and with at least one organic polysulfide of the formula $R^1-(S)_n-R^2$, where R^1 and R^2 are identical or different, each representing a hydrocarbon radical having five to 150 carbon atoms and n being an intergral number from 2 to 20, the amounts of metal compound and of asphaltenes being such that the ratio by weight of metal to asphaltenes ranges from about 0.05:1 to 10:1 and the amount of organic polysulfide which is utilized being sufficient to introduce an amount of sulfur at least equal to the amount of sulfur necessary for the substantially complete conversion of the major part of the metal present into a sulfurized metallic compound which is a catalytic precursor, and

(2) heating the product resulting from stage (b) in the presence of a gas containing hydrogen under a partial hydrogen pressure ranging from about 0.5 to 20 MPa, at a temperature ranging from about 260° to 450° C. for 0.1 to 24 hours, and

(c) subjecting the product resulting from stage (b) to hydrovisbreaking conditions for a time sufficient for carrying out hydrovisbreaking of the charge.

5,024,752

UPGRADING OF RESIDS BY LIQUID PHASE MILD COKING

Tsoung Y. Yan, Philadelphia, Pa., assignor to Mobil Oil Corporation, Fairfax, Va.

Continuation-in-part of Ser. No. 105,987, Oct. 6, 1987, abandoned, which is a continuation of Ser. No. 854,952, Apr. 23, 1986, abandoned. This application Sep. 18, 1989, Ser. No. 408,353
Int. Cl.[5] C10G *9/14*
U.S. Cl. 208—131 7 Claims

1. A process for upgrading a heavy hydrocarbon feedstock in the liquid phase to evolve at least one less dense liquid gas oil phase and one more dense liquid coke phase in the absence of substantial solid coke formation, said liquid phases being at least partially immiscible, said process comprising the steps of:

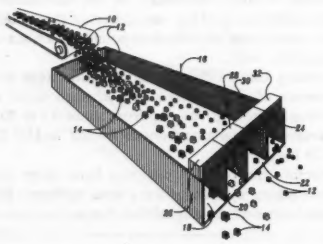
(a) determining the Conradson Carbon Residue weight percentage of said hydrocarbon feedstock;
(b) thermally treating said heavy hydrocarbon feedstock under conversion conditions including a combination of temperature and residence time sufficient to convert at least a portion of said heavy hydrocarbon feedstock, at the highest severity in equivalent reaction time which correlates with liquid coke being formed in a quantity of between about 1 wt. % and 200 wt. % of the heavy hydrocarbon feedstock Conradson Carbon Residue weight percentage in the absence of substantial solid coke formation;
(c) controlling the temperature of said thermally treated heavy hydrocarbon feedstock to prevent substantial formation of solid coke;
(d) holding said liquid of step (c) at said controlled temperature for a period of time sufficient for said liquid to separate into two at least partially immiscible liquid layers;
(e) continuously withdrawing gas oil from the upper layer of said liquid of step (d);
(f) continuously withdrawing liquid coke from the lower layer of said liquid of step (d).

5,024,753

MATERIAL SEPARATION EFFICIENCY DETERMINATION EMPLOYING FLUORESCING CONTROL PARTICLES

Colin D. Chriswell, Slater; Richard Markuszewski, Ames, and William H. Buttermore, Ames, all of Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Oct. 3, 1989, Ser. No. 416,710
Int. Cl.[5] B03B *13/02*
U.S. Cl. 209—1 **36 Claims**



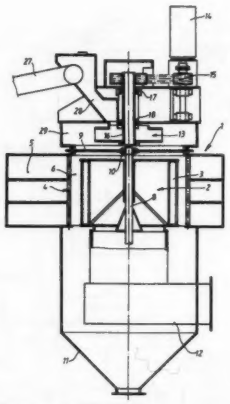
1. A method for improved material separation comprising:
bonding a fluorescing dye to control particles of the material, the control particles having generally known and generally consistent physical properties;
mixing the control particles into the material which is to be separated on the basis of at least one physical property;
separating the material by a physical property;
imposing upon the separated material energy of sufficient properties to excite the fluorescing dye on the control particles; and
monitoring the separated material to detect the presence of and the amount of excited fluorescence to determine the amount of control particles in the separated material and to determine if the separation process is adequately separating the material.

5,024,754

SEPARATOR

Norbert Patzelt, Beckum, and Michael von Seebach, Ennigerloh, both of Fed. Rep. of Germany, assignors to Krupp Polysius AG, Fed. Rep. of Germany

Filed Dec. 5, 1989, Ser. No. 446,397
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1988, 3843338
Int. Cl.[5] B07B *0/83*
U.S. Cl. 209—135 **14 Claims**



1. A separator comprising
(a) a driven rotor having a vertical axis and blades spaced from one another about its periphery,
(b) rotatable material distributor means above the rotor,
(c) means for delivering material to be separated to the material distributor means,
(d) a stationary guide unit encircling the rotor with a clearance therebetween and having adjustable guide vanes, a separating chamber between the guide unit and the rotor for receiving material thrown off by the material distributor means and through which may pass a stream of separating air delivered through the guide unit and drawn off through the rotor so as to entrain fines,
(e) a channel connected to one end of the rotor for removal of the stream of separating air and entrained fines,
(f) a tailings hopper below the rotor and the guide unit (4) for removal of tailings,
characterized in that:
(g) the material distributor is driven independently of the rotor by separate drive means for radially discharging the material to be separated, and
(h) an annular chamber radially encircling and radially spaced from the material distributor means, said chamber being open toward the material distributor means to form a material impact and disagglomeration zone for receiving the material discharged from the material distributor means and in which zone a heap of material may form to protect against wear of the chamber.

5,024,755

CONE WEAR DETECTION

James D. Livsey, Rochester, Mass., assignor to Bird Escher Wyss, Mansfield, Mass.

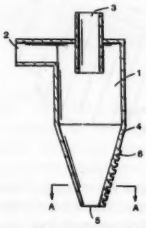
Filed Nov. 22, 1989, Ser. No. 440,891
Int. Cl.[5] B04C *5/08*
U.S. Cl. 209—211 **6 Claims**

1. A hydrocyclone for separating abrasive contaminants, said hydrocyclone comprising
a generally conical separation chamber having an outer wall

subject to wear on its inside surface from said abrasive contaminants,

at least one area of reduced wall thickness on said outer wall, said area of reduced wall thickness allowing formation of a localized wear aperture as said abrasive contaminants wear said inside surface,

the outside surface of said outer wall being shaped for retaining a sealing member directly against said wear aperture and surrounding said outside surface of said wall to retard



flow of liquid through said outer wall following formation of said wear aperture,

said area of reduced wall thickness being provided by a substantially tangential groove formed in said outer wall, said groove shaped to restrict the outward movement of said sealing member, and

said sealing member having a cross-sectional shape substantially matching that of said groove, so that said sealing member is mated with said groove by sliding in a tangential direction to said outer wall.

5,024,756

DIALYSIS SYSTEM AND METHOD THEREFOR

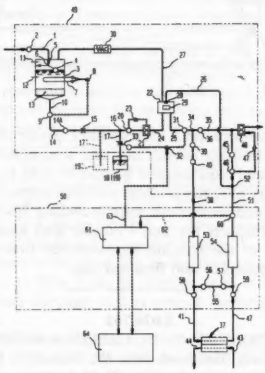
Jan P. Sternby, Lund, Sweden, assignor to Gambro AB, Sweden

Filed Feb. 28, 1989, Ser. No. 316,999

Claims priority, application Sweden, Mar. 3, 1988, 8800757

Int. Cl.[5] B01D *61/32, 63/00*

U.S. Cl. 210—93 **16 Claims**



1. A dialysis system comprising a dialyzer having (i) a dialysis liquid input side and a dialysis liquid output side for the flow of a dialysis liquid therethrough, and (ii) a blood input side and a blood output side for the flow of blood therethrough, control means for controlling one or more parameters of the dialysis liquid at a non-measured desired set value on the dialysis liquid input side of said dialyzer, measuring means for measuring the value of at least one of said parameters of said dialysis liquid on the dialysis liquid output side of said dialyzer, and comparison means for comparing the value of the measured parameter with the non-measured desired set value of the corresponding parameter being controlled by said control means.

5,024,757

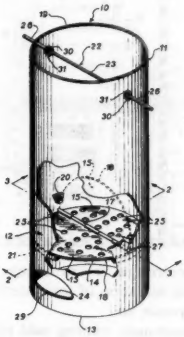
APPARATUS FOR REMOVING ICE FROM A CHOPPED OR CUT HOLE

Francis R. Malak, 3205 N. 29th St., Wausau, Wis. 54401

Filed May 3, 1990, Ser. No. 518,167

Int. Cl.[5] B01D *35/02, 35/28*

U.S. Cl. 210—136 **11 Claims**



1. An apparatus for removing suspended solid material from a water filled hole comprising:

a thin-walled tubular body having a cross sectional size and shape corresponding to that of the hole;

check valve means in the lower end of said tubular body for admitting water and suspended solid material into said tubular body in response to downward insertion of the body into the hole and for closing and retaining the solid material in said tubular body in response to reverse upward withdrawal of the body from the hole; and,

strainer means formed integrally with said check valve means for permitting the water to drain from said tubular body in response to said upward withdrawal.

5,024,758

HORIZONTAL FLOW-THROUGH COIL PLANET CENTRIFUGE WITH MULTILAYER PLURAL COILS IN ECCENTRIC SYNCHRONOUS ROTATION, SUITABLE FOR COUNTER-CURRENT CHROMATOGRAPHY

Yoichiro Ito, Bethesda, Md., assignor to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation of Ser. No. 287,664, Dec. 20, 1988, abandoned. This application Mar. 19, 1990, Ser. No. 496,144

Int. Cl.[5] B01D *15/08*

U.S. Cl. 210—198.2 **17 Claims**

1. An apparatus suitable for eccentric continuous countercurrent chromatography of predetermined fluid flow therethrough and for providing stable retention of low interfacial tension, viscous two-phase systems therein, comprising:

a support;

frame means rotatably mounted to said support for rotation about a first stationary horizontal axis;

column assembly support means having opposite end portions disposed on a second axis parallel to and separated from said first axis by a first radius R_1, rotatably mounted to said frame means for enabling rotation of a column assembly with respect to said frame means about said second axis while said frame simultaneously rotates about said first axis;

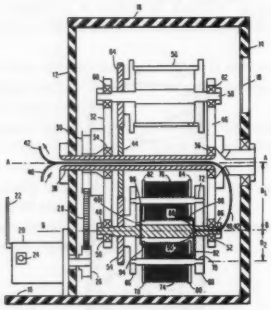
a plurality of similar multilayer helical tubing coils each having respective tail and had ends selectively connected

to enable continuous fluid flow therethrough, each of said helical coils being wound about one of an equal number of cylindrical columns of said column assembly about corresponding third axes parallel to said first and second axes and symmetrically disposed therearound at a common second radius R_2;

said coils sized and dimensioned to reduce physical deformation due to centrifugal forces acting thereon, and for providing stable retention of low interfacial tension, viscous solvent system; and

means for simultaneously rotating said frame means about said first axis and said column assembly support means about said second axis,

thereby providing eccentric rotation of said column assembly.



5,024,759

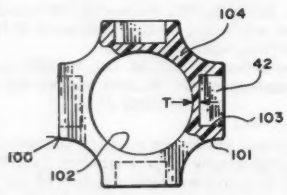
MAGNETIC TREATMENT OF FLUIDS

Thomas M. McGrath, Miami, and Arno W. Tilles, Hollywood, both of Fla., assignors to Hydroquip Technologies, Inc., Miami, Fla.

Continuation-in-part of Ser. No. 287,230, Dec. 21, 1988, abandoned. This application Jun. 2, 1989, Ser. No. 361,674

Int. Cl.[5] C02F *1/48*

U.S. Cl. 210—222 **8 Claims**



1. Magnetic apparatus for magnetically treating microcellular organisms such as algae and *escherichia coli* in flowing water over a wide range of flow rates comprising:

a frame member having a plurality of magnets attached therearound such that the same pole of each magnet faces inside said frame toward the other magnets wherein said frame comprises an eight-sided member with an outer periphery having four flat sides positioned at 90° to each other, and four concave surfaces each connecting adjacent flat sides, an opening through the center of said frame member and a magnet imbedded in each of the four flat sides.

5,024,760

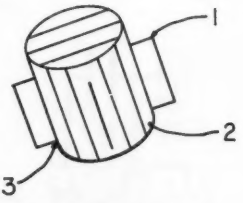
EASILY REMOVABLE OIL FILTER

John J. Kemper, 5512 Sara Dr., Torrance, Calif. 90503, assignor to John Joseph Kemper, Torrance, Calif.

Filed May 24, 1990, Ser. No. 473,636

Int. Cl.[5] B01D *27/00*

U.S. Cl. 210—232 **5 Claims**



1. In an oil automotive filter comprising an outer filter body and an internal filter material wherein the improvement comprises means for enabling wrench free installation and removal of said oil filter comprising 3 or more permanently attached brackets of suitable material, said brackets being equally spaced around the circumference of said oil filter body and having a length, wherein the length of the brackets is about ¾ of the length of said filter body.

5,024,761

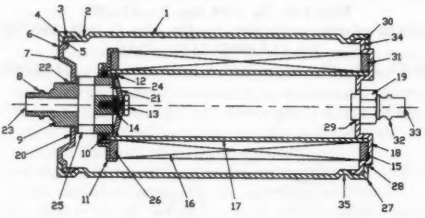
HIGH-STRENGTH QUICK-DISCONNECT TUBE FILTER

Richard J. Deibel, 501 Pine St., Bamberg, S.C. 29003

Filed Jan. 25, 1990, Ser. No. 470,052

Int. Cl.[5] B01D *27/08*

U.S. Cl. 210—232 **5 Claims**



1. A high pressure quick change filter device comprising: a tubular metal housing having first and second ends; first and second metal end caps secured thereto by said housing being folded inwardly over the periphery of each respective said end cap; said first and second end caps including first and second male fittings, respectively; and a tubular filter element disposing internally of the housing between said first and second fittings and bonded to said first end cap.

5,024,762

CONCENTRATION OF SOLIDS IN A SUSPENSION

Douglas L. Ford, Eastwood; Eric W. Anderson, Dundas, and Clinton V. Kopp, Castle Hill, all of Australia, assignors to Memtec Limited, Parramatta, Australia

Division of Ser. No. 939,121, Oct. 27, 1986, Pat. No. 4,931,186. This application Jan. 5, 1990, Ser. No. 461,297

Claims priority, application Australia, Mar. 5, 1985, 9572; Mar. 13, 1985, 9692

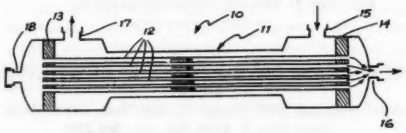
Int. Cl.[5] B01D *65/02*

U.S. Cl. 210—321.69 **9 Claims**

1. A concentrator for concentrating the fine solids of a liquid feed suspension comprising:

(i) a shell,

(ii) a plurality of elastic, hollow, microporous, polymer fibres within the shell,
(iii) means for supplying pressurised feed suspension to the outside of the fibres,
(iv) means for withdrawing clarified liquid from the fibre lumens,
(v) means for applying liquid followed by gas under pressure



to the fibre lumens to effect a transmembrane cleaning of the fibres, the pressure of the liquid being sufficient to stretch substantially all of the pores of the fibres and the pressure of the gas being sufficient to ensure that the gas will pass through the larger pores of the fibres to dislodge any solids retained therein and to wash the external walls of the fibres and the interior of the shell to remove all solids from the shell to an external collection point.

5,024,763

FILTERING APPARATUS

Arthur Schlaginhaufen, Rothrist, Switzerland, assignor to Arthur Schlaginhaufen Ing., Switzerland

Filed Jan. 8, 1990, Ser. No. 462,063

Claims priority, application Fed. Rep. of Germany, Jan. 9, 1989, 3900390

Int. Cl.[5] B01D *29/64*

U.S. Cl. 210—333.01 **12 Claims**

1. A filtering apparatus for a house water main installation, comprising:

a housing having a water inlet and a water outlet;

a filter bell dome removably connected to said housing;

a cylindrically shaped main filter member having a water flow path therethrough and mounted in the interior of said filter bell dome;

a cylindrically shaped reversing flow filter member having a water flow path therethrough and superposed to said main filter member and mounted in the interior of said filter bell dome;

a tubular guiding member located in the interior of said reversing flow filter member and connecting the interior of said main filter member and said outlet of said housing;

a filter support member for mounting said main filter member and said reversing flow filter member, said filter support member being rotatable and axially adjustable between a backwashing position in which the flow path through the reversing flow filter member is open and a normal position in which the flow path through the reversing flow filter member is closed, said filter support member including first sealing means;

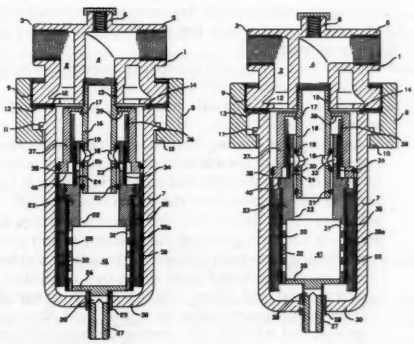
support means for directing water flow to said main filter member to flow from its exterior to its interior when the flow path through said reversing flow filter member is closed;

said support means including second sealing means cooperating with said first sealing means of said filter support member to block the flow path through said main filter member from its exterior to its interior when the flow path through said reversing flow filter member is open, the flow of water to the outer surface of said reversing flow filter member flowing through said reversing flow filter and then partially through said outlet and partially through said main filter member from its interior to its exterior when the flow path through said reversing flow filter member is open;

a first brush means for cleaning said main filter member, said first brush means fixedly mounted in the interior of said filter bell dome and located adjacent to said main filter member;

a second brush means for cleaning said reversing flow filter member, said second brush means fixedly mounted in the interior of said filter bell dome and located adjacent to said reversing flow filter member;

said first brush means engaging outer surfaces of said main filter member and said second brush means engaging outer surfaces of said reversing flow filter member;



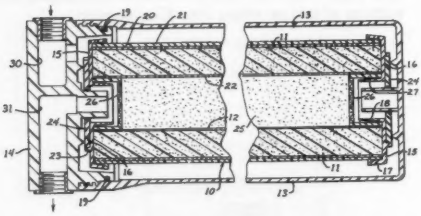
means for adjusting said main filter member and for causing said main filter member and said reversing flow filter member mounted on said filter support member to perform a spiral rotational movement when said filter support member is adjusted from its normal position to its backwashing position and vice versa whereby the outer surfaces of said main filter member and said reversing flow filter member, respectively, are mechanically cleaned by said first and second brush means, respectively.

5,024,764

METHOD OF MAKING A COMPOSITE FILTER

Thomas D. Holler, Sheboygan, Wis., assignor to Ametek, Inc., Sheboygan, Wis.

Filed Mar. 17, 1989, Ser. No. 325,245
Int. Cl.[5] B01D 27/14
U.S. Cl. 210—484 5 Claims



4. A method for the in situ preparation of a granular deionizing resin bed in a filter chamber of a composite activated carbon/deionizing resin filter comprising the steps of:

(1) preparing an aqueous slurry of dionizing resin beads;

(2) filling the chamber with the slurry; and,

(3) removing the water from the slurry and drying the beads to cause the beads to fracture into a granular form.

5,024,765

COMPOSITE MEMBRANES AND PROCESSES USING THEM

Charles Linder, Rehovot; Mordechai Perry, Petach Tikva; Mara Nemas, Neve Monosson, and Reuven Katraro, Rishon Lezion, all of Israel, assignors to Aligena AG, Basel, Switzerland

Filed Oct. 2, 1989, Ser. No. 416,224
Int. Cl.[5] B01D 69/12
U.S. Cl. 210—651 34 Claims

34. A reverse osmosis or ultrafiltration process which comprises the steps of:

disposing a solution on one side of a composite membrane as solution which it is desired to concentrate or resolve into components;

applying a hydraulic pressure which is greater than the osmotic pressure of the solution; and

recovering at least one member selected from the group consisting of solution which has passed through said membrane and solution which has remained on the said one side of said membrane;

and wherein said composite membrane comprises the following components (a), (b) and (c), namely:

(a) a porous semipermeable membrane substrate of an aromatic polysulfone,

(b) a superimposed coating thereon which has been coated onto substantially the whole of the external and internal surfaces of said substrate, said coating including at least one member selected from the group consisting of polymers containing at least one diazonium group, and polymers containing at least one primary amino group and which have been exposed to the action of at least one member selected from the group consisting of nitrous acid and other reagents which potentially react with primary amino groups to form diazonium groups, and wherein said coating has been subjected to at least one in situ chemical reaction with loss of any diazonium groups which may be present, and with formation of valence links in at least one of the modes (i), (ii) and (iii); namely:

(i) among different moieties of said at least one member between themselves,

(ii) between moieties of said at least one member and the material of the substrate, and

(iii) between moieties of said at least one member and a polyfunctional reactant, the reaction in this case having been effected so as to leave residual reactive functions, and

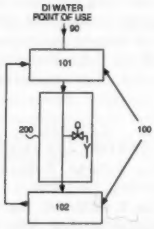
(c) a polymer which contains functions selected from the group consisting of cations, anions, —NH—, —NH_2—, —OH and —SH, and which is selected from the group consisting of hydrophilic and polyelectrolyte polymers, which polymer has been reacted with said residual functions and subsequently has been subjected to reaction with at least one cross-linking agent.

5,024,766

POINT OF USE DEIONIZED WATER PURIFICATION UNIT

Shahzad Mahmud, 4050 Naomi Ct., San Jose, Calif. 95136

Filed Nov. 9, 1988, Ser. No. 269,219
Int. Cl.[5] C02F 9/00
U.S. Cl. 210—668 21 Claims



1. A point of sue water purification apparatus for insertion in a purified water supply line at the location of another apparatus requiring high purity water, the water supply line normally supplying such another apparatus with deionized purified water, said deionized purified water having impurities such as bacteria, particulates, organic carbon contaminants, and a resistivity of about 17–18 megohm-cm, said point of use water purification apparatus comprising:

means, operatively connectable to such a water supply line, for generating a flow of water having an approximately constant pressure, the flow generating means having an inlet and an outlet wherein the inlet receives water from such a water supply line and the approximately constant water pressure is generated at the outlet;

means, operatively connected to said generating means, for reducing organic carbon contaminants and having an inlet and an outlet wherein water received at the inlet of the organic carbon contaminant reducing means from said generating means has a first level of organic carbon contaminants and water at the outlet of the organic contaminant reducing means has a second level of organic carbon contaminants, the second organic carbon contaminants level being less than the first organic carbon contaminants level;

means, operatively connected to the organic carbon contaminant reducing means, for filtering water and having an inlet and an outlet wherein water from said organic carbon contaminant reducing means, received by the inlet of said filtering means, has a first level of particulates and water at the outlet of said filtering means has a second level of particulates which is lower than said first level;

coupling means, operatively connected to said filtering means and operatively connectable to such another apparatus, for providing the water from the filter means to such another apparatus upon demand;

means, operatively coupled to the coupling means, for polishing water and having an inlet and an outlet wherein water from said coupling means is provided to the inlet of the polishing means and the polished water is provided at the outlet of the polishing means;

means, operatively connected to said polishing means, for sterilizing and having an inlet coupled to the outlet of said

polishing means and an outlet, said outlet being coupled to the inlet of said generating means to form a recirculation path through said point of use water purification apparatus; and

control means, operatively coupled to said organic carbon contaminant reducing means, to said polishing means and to said sterilization means, for selecting the mode of operation of said point of use water purification apparatus wherein in a first mode of operation, the point of use water purification apparatus provides high purity water to such another apparatus, and in a second mode of operation, said recirculation path through the point of use water purification apparatus is sterilized.

5,024,767

METHOD FOR PURIFYING LIQUIDS

Nami Kubo; Toshio Yoshioka, both of Otsu; Kouichi Saito, Kasatsu, and Syunroku Tohyama, Yasu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Jan. 3, 1990, Ser. No. 460,549

Claims priority, application PCT Int'l Appl., Apr. 4, 1988, PCT/JP88/00341

Int. Cl.[5] B01D *15/04;* **C02F** *1/42*

U.S. Cl. 210—682 **13 Claims**

1. A method of purifying a contaminated liquid comprising bringing the liquid into contact with a mixture of (1) a graft polymer, having carboxyl groups grafted onto a polyamide or polyester, as a cation exchanger, and (2) an anion exchanger.

5,024,768

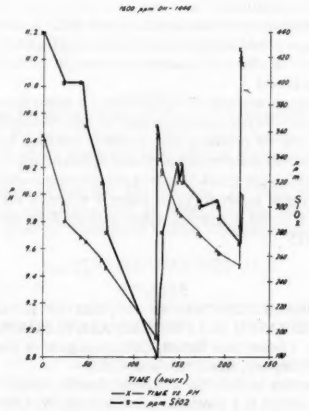
ORGANIC POLYMER ACTIVATOR FOR DETACKIFICATION

Gene A. Merrell, Huntingdon Valley, Pa., assignor to Betz Laboratories, Inc., Trevose, Pa.

Continuation-in-part of Ser. No. 327,846, Mar. 23, 1989, which is a continuation-in-part of Ser. No. 161,866, Feb. 29, 1988, Pat. No. 4,853,132. This application May 26, 1989, Ser. No. 358,296

Int. Cl.[5] C02F *1/56*

U.S. Cl. 210—712 **7 Claims**



1. A process for detackifying and coagulating paint, lacquer or enamel in a spray booth in which water is used to wash air in said booth in order to remove oversprayed paints, lacquers or enamels from said water prior to the recirculation of said water for the further washing of air in said spray booth comprising the steps of adding to said water at least about 300ppm of a water-soluble or water-dispersible cationic organic polymer selected from the group consisting of:

dimethylamine-epichlorohydrin,

polydiallyldimethylammonium chloride,

condensation product of hexamethylenediamine still bottoms plus ethylene dichloride,

condensation product of dimethylamine plus epichlorohydrin plus ethylene diamine,

dimethylamine-epichlorohydrin/polydiallyl dimethyl ammonium chloride, in the ratio of about 3/1.

condensation product of hexamethylenediamine still bottoms plus ethylene dichloride/condensation product of dimethylamine plus epichlorohydrin plus ethylene diamine, in the ratio of about 3/1,

dimethylamine-epichlorohydrin/condensation product of dimethylamine plus epichlorohydrin plus ethylene diamine, in the ratio of about 1/1,

condensation product of dimethylamine plus epichlorohydrin plus ethylene diamine/polydiallyl dimethyl ammonium chloride, in the ratio of about 3/1,

in selective combination with a sufficient amount for the purpose of an anionic organic polymer selected from the group consisting of:

maleic anhydride,

maleic anhydride/diisobutylene, and

polyacrylic acid, wherein said sufficient amount of said maleic anhydride is at least about 1500ppm, wherein said sufficient amount of said maleic anhydride/diisobutylene is at least about 1000ppm, and wherein said polyacrylic acid has a molecular weight of at least about 243,000, and said sufficient amount of polyacrylic acid is at least about 1000pm.

5,024,769

METHOD OF TREATING AN ARSENIC-CONTAINING SOLUTION

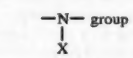
Darrell L. Gallup, Chino, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 345,177, May 1, 1989, and Ser. No. 226,039, Jul. 29, 1988. This application Jan. 31, 1990, Ser. No. 473,226

Int. Cl.[5] C02F *1/76, 1/58*

U.S. Cl. 210—721 **50 Claims**

1. A method of treating an aqueous solution containing one or more arsenic compounds in a +3 oxidation state comprising, contacting the aqueous solution with an amount of an oxidizing agent to convert substantially all of the +3 oxidation state arsenic to a +5 oxidation state, said amount being substantially less than that which theoretically would be required to react with substantially all of the arsenic in the +3 oxidation state and any other oxidizable species in the aqueous solution, said oxidizing agent including at least one



wherein X is a halogen.

5,024,770

WASTE SEPARATING, PROCESSING AND RECYCLING SYSTEM

John A. Boyd, Arlington, Va., and George M. Staples, III, Salisbury, Md., assignors to American Materials Recycling Inc., Arlington, Va.

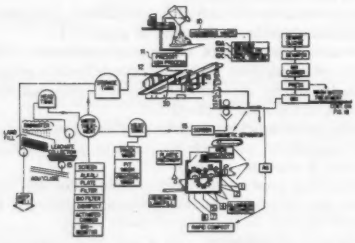
Filed Jul. 15, 1988, Ser. No. 219,275

Int. Cl.[5] B02C *11/08, 21/00, 23/08*

U.S. Cl. 210—747 **7 Claims**

1. A method for pulverizing and separating municipal solid waste into its component parts comprising: collecting and pre-sorting municipal solid waste, processing and separating the pre-sorted waste in a wet mill rotary separator means into soluble, biodegradable material and non-soluble, non-biodegradable material, pumping and injecting groundwater from an aquifer beneath a landfill into said wet mill separator, said

aquifer comprising a mixture of groundwater and untreated leachate from said landfill, wherein said groundwater is utilized in process steps of softening and pulverizing the biode-



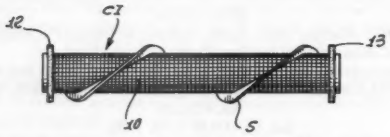
gradable material and utilizing two separate conveyor means to remove both the softened, pulverized biodegradable material and the non-biodegradable material to further processing.

5,024,771

LIQUID FILTER AND METHODS OF FILTRATION AND CLEANING OF FILTER

Richard J. Chiarito, Corona, Calif., assignor to Everfilt Corporation, Corona, Calif.

Filed Feb. 14, 1990, Ser. No. 480,062
Int. Cl.[5] B01D *24/46*
U.S. Cl. 210—791 **10 Claims**



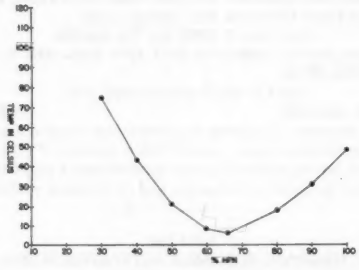
9. A method of filtration of solid contaminants from a liquid by means of a screen filter and cleaning the screen, without removing the screen filter from the filter housing, including the steps of providing a filter housing for a screen filter to be accommodated therein with the liquid to be filtered being conveyed into the housing between the screen filter and the inner wall of the housing and the filtered liquid being conveyed through the screen filter, the housing having an inlet port for receiving a liquid to be filtered, a discharge port for the filtered liquid to exit the filter housing and a flush port for discharging contaminants in the liquid undergoing filtering separated from the liquid during filtering, mounting a screen filter in the filter housing in a spaced relationship with the housing for conveying a liquid to be filtered, the screen filter and the filter housing being constructed and designed relative to one another for increasing the velocity to the liquid to be filtered admitted into the housing at the inlet port and conveyed over the surface of the screen filter to the discharge port thereby causing the heavier contaminants to be forced towards the housing wall and the lighter contaminants to be conveyed along the outer surface of the screen filter, arranging an isolation control valve at the outlet port for controlling the flow of the filtered liquid therefrom, arranging a control valve at the flush port for controlling the flow of the contaminants through the flush port, closing the isolation control valve and the flush port control valve for equalizing the pressure on both sides of the screen filter and then opening the flush port control valve for creating a low pressure condition on the outside surface of the screen filter whereby the higher pressure on the opposite side of the screen filter will cause the solid contaminants to move away from the screen filter including the contaminants lodged in the screen filter while a higher velocity imparted with a directional flow towards the flush port to the liquid admitted into the inlet port, and admitting a liquid of a preselected velocity into the housing at the inlet port to be conveyed between the housing wall and the adjacent surface of the screen filter causing the liquid to flow through the screen filter and thereby filtering out the solid contaminants that are conveyed out of the flush port during the interval the isolation control valve is closed and the flush port control valve is open.

5,024,772

METHOD OF PRODUCING HPN AND MIXTURES THEREOF

Laurance R. Thurman, Clute; Joseph P. Dowd, and Kathy J. Fischer, both of Lake Jackson, all of Tex., assignors to BASF Corporation, Wyandotte, Mich.

Filed Jul. 10, 1989, Ser. No. 377,079
Int. Cl.[5] C07C *69/66*
U.S. Cl. 252—1 **19 Claims**



1. A process for making a product mixture having a preselected concentration of a 2,2-dimethyl-3-hydroxypropyl-2,2-dimethyl-3-hydroxypropionate component comprising the steps of:

a) heating the reaction mixture having a hydroxypivalic acid component and a neopentyl glycol component to a preselected temperature ranging from about 120° C. to about 170° C., said neopentyl glycol component ranging from about 10 percent to about 85 percent by weight of said reaction mixture,

b) contacting said reaction mixture with a mineral acid having a preselected concentration ranging from about 0.2 percent to about 0.5 percent by weight of said reaction mixture, and

c) adding an amount of 2,2-dimethyl-3-hydroxypropyl-2,2-dimethyl-3-hydroxypropionate to said reaction mixture sufficient to produce said product mixture having said preselected concentration of said 2,2-dimethyl-3-hydroxypropyl-2,2-dimethyl-3-hydroxypropionate component.

5. A process as set forth in claim 1 wherein said product mixture is a liquid at a temperature ranging from about 10° C. to about 125° C.

5,024,773

METHODS FOR PREPARING, GROUP II METAL OVERBASED SULFURIZED ALKYLPHENOLS

Thomas V. Liston, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 195,559, May 16, 1988, Pat. No. 4,971,710, which is a continuation of Ser. No. 921,299, Oct. 21, 1986, Pat. No. 4,744,921. This application May 17, 1989, Ser. No. 353,288
The portion of the term of this patent subsequent to Nov. 20, 2007, has been disclaimed.
Int. Cl.[5] C10M *129/00, 135/00*
U.S. Cl. 252—42.7 **11 Claims**

1. A method for preparing a Group II metal overbased sulfurized alkylphenol which comprises reacting in an inert diluent an alkylphenol, wherein the alkyl group contains a

sufficient number of carbon atoms to render oil-soluble the resulting Group II metal overbased sulfurized alkylphenol, sulfur, a Group II metal oxide,, hydroxide or C_1–C_6 alkoxide, a C_2–C_4 alkylene glycol, an alkanol of at least 8 carbon atoms and a compound selected from an oil-soluble Group II metal overbased hydrocarbyl sulfonate and an alkenyl succinimide, in the presence of a sulfurization catalyst, followed by reaction with carbon dioxide.

5,024,774

NITROGEN CONTAINING ANTI-OXIDANT COMPOSITIONS

Mary F. Salomon, Cleveland Heights, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Continuation of Ser. No. 210,603, Jun. 23, 1988, Pat. No. 4,915,858, which is a continuation of Ser. No. 59,884, Jun. 9, 1987, Pat. No. 4,798,684. This application Aug. 10, 1989, Ser. No. 391,758

The portion of the term of this patent subsequent to Nov. 15, 2005, has been disclaimed.

Int. Cl.[5] C10M *135/28*

U.S. Cl. 252—47 **5 Claims**

1. A composition of the formula

$$R^1R^2N(AS_xAO)_yAS_xANR^3R^4$$

wherein A is an alkylene group, x is at least one, y is 0 and R^1R^2N and R^3R^4N are both phenothiazine structures or phenothiazine derivatives or mixtures thereof.

5,024,775

ALKYL PHENOL STABILIZER COMPOSITIONS FOR FUELS AND LUBRICANTS

J. Vincent Hanlon, St. Louis, Mo., and Scott A. Culley, Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Nov. 6, 1989, Ser. No. 432,164

Int. Cl.[5] C10M *129/10*

U.S. Cl. 252—52 R **13 Claims**

1. A liquid mixture of alkyl phenols consisting essentially of:
a) from 1 to 8 wt% of 2-tert-butylphenol;
b) from 4 to 12 wt% of 2,6-di-tert-butylphenol;
c) from 4 to 12 wt% of 2-tert-butyl-4-n-butylphenol;
d) from 4 to 12 wt% of 2,4,6-tri-tert-butylphenol; and
e) from 65 to 80 wt.% of 2,6-di-tert-butyl-4-n-butyl-phenol.

5,024,776

MACHINE DISHWASHING COMPOSITIONS

Pieter H. Kreischer, Hellevoetsluis, Netherlands, assignor to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Continuation of Ser. No. 234,245, Aug. 19, 1988, abandoned. This application Oct. 10, 1990, Ser. No. 596,630

Claims priority, application United Kingdom, Aug. 21, 1987, 8719776

Int. Cl.[5] C11D *9/42;* **D06L** *3/00*

U.S. Cl. 252—97 **5 Claims**

1. A thixotropic machine dishwashing composition structured in micellar form comprising:
(a) 0.1–35% by weight alkali-metal builder;
(b) 0.1–30% by weight alkali-metal silicate having a molar ratio of SiO_2/Na_2O and/or K_2O of from 2.0 to 3.25;
(c) 0.1–10 by weight chlorine bleach;
(d) 0.1–5% by weight surfactant system comprising 0.05–4.95% by weight of the composition of a non-soap anionic surfactant and soap, the anionic and soap being preseat at a ratio of from 4:1 to 1:4; and
(e) water;
the total level electrolyte in the composition being greater than 20% by weight of the composition, said composition having a yield point of between 5–50 Pa and a viscosity between 500–5000 mPas at $20s^{-1}$.

5,024,777

SYNERGISTIC LIME SOAP DISPERSING COMPOSITION

Kim R. Smith, and James E. Borland, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Jan. 23, 1990, Ser. No. 468,763

Int. Cl.[5] C11D *9/30, 9/00*

U.S. Cl. 252—117 **8 Claims**

1. A bar soap composition having superior lime soap dispersing properties, said composition containing 5–95 weight percent of a fatty acid soap 1 to 40 wt. % of each of and a C_{8-20} alkyl dimethylamine oxide and sodium cocoyl isethionate in a synergistic weight ratio of 0.33–3.0 parts C_{8-20} alkyl dimethylamine oxide per part of sodium cocoyl isethionate.

5,024,778

SPRAY DRIED BASE BEADS FOR DETERGENT COMPOSITIONS CONTAINING ZEOLITE, BENTONITE AND POLYPHOSPHATE

John J. Grecsek, Trenton, N.J., assignor to Colgate-Palmolive Company, Piscataway, N.J.

Continuation of Ser. No. 523,642, Aug. 15, 1983, abandoned, which is a continuation of Ser. No. 332,004, Dec. 18, 1982, abandoned, which is a continuation-in-part of Ser. No. 279,550, Jul. 1, 1981, abandoned, which is a continuation-in-part of Ser. No. 238,619, Feb. 26, 1981, abandoned. This application Aug. 29, 1984, Ser. No. 645,463

Int. Cl.[5] C11D *7/16, 3/06, 3/14, 17/00*

U.S. Cl. 252—140 **2 Claims**

1. Free flowing, zeolite-containing spray dried base beads, of a bulk density in the range of 0.2 to 0.8 g./cc. and particle sizes in the range of No's. 10 to 100, U.S. Sieve Series, useful for the manufacture of a particulate built synthetic nonionic organic detergent composition, which composition is mechanically stable and of reduced zeolite deposition characteristics due to the presence therein of bentonite and the absence of water soluble silicate, comprising 15 to 35% of zeolite A, 5 to 20% of beneficiated Wyoming bentonite, having a swelling capacity, in water, of 3 to 15 ml./g., having a viscosity of 3 to 30 centipoises at 6% concentration in water, and containing at least 4% of moisture therein, 15 to 40% of pentasodium tripolyphosphate, 0.05 to 5% of sodium polyacrylate of a molecular weight in the range of about 1,000 to 5,000, 5 to 10% of moisture and 0% of sodium silicate, in which the proportion of bentonite:zeolite is in the range of 1:6 to 1:2, that of tripolyphosphate:zeolite is within the range of 1:2 to 2:1 and that of bentonite:tripolyphosphate is within the range of 1:6 to 1:2.

5,024,779

CREAMY NAIL POLISH REMOVER CONTAINING HYDROLYZED AND NEUTRALIZED MALEIC ANHYDRIDE C_1–C_4 ALKYL VINYL ETHER COPOLYMER

Michael W. Helioff, Westfield; Mohammed Tazi, Wayne, both of N.J.; Yoon T. Kwak, Brooklyn, N.Y., and Robert B. Login, Oakland, N.J., assignors to GAF Chemicals Corporation, Wayne, N.J.

Filed Sep. 6, 1990, Ser. No. 578,173

Int. Cl.[5] C11D *7/00*

U.S. Cl. 252—162 **8 Claims**

1. A creamy nail polish remover composition consisting essentially of
(a) about 50 to 95% by weight of a solvent selected from acetone, methyl ethyl ketone, ethyl acetate and butyrolactone, and mixtures thereof, in an amount effective to remove nail polish from a nail;
(b) about 0.25 to 3.0% by weight of a hydrolyzed and neutralized crosslinked maleic anhydride-C_1–C_4 alkyl vinyl ether copolymer gel said copolymer crosslinked with a polyethylenically unsaturated compound;
(c) about 0.20 to 2.4% by weight of a neutralizing agent;
(d) about 0–25% by weight of water; and

(e) about 0–25% by weight of a humectant,

said composition having a viscosity of about 10,000 to 50,000 cps as measured by a Brookfield viscometer Model RVT at 10 rpm TD spindle at 25° C.

5,024,780

CLEANER FOR TREATING A SURFACE

Cassius W. Leys, Hartsdale, N.Y., assignor to A.G.P. Systems, Inc., Windham, N.Y.

Filed Aug. 30, 1989, Ser. No. 400,564

Int. Cl.[5] C09D *9/00*; C11D *7/22, 7/50*

U.S. Cl. 252—162 **14 Claims**

1. A cleaner for removing graffiti, paint and other coatings from a surface, said cleaner comprising:

(a) N-methylpyrrolidone in an amount between about 20 to about 40 percent by volume of said cleaner;

(b) propylene carbonate in an amount between about 20 to about 50 percent by volume of said cleaner;

(c) a hydroxy propyl cellulose thixotropic thickening agent in an effective amount;

(d) a dispersing ingredient which is selected from the group consisting of dipropylene glycol monomethyl ether acetate and dipropylene glycol methyl ether;

(e) isocetyl alcohol, wherein said isocetyl alcohol and said dispersing ingredient are present in an amount which totals no more than 40 percent by volume of said cleaner; and

(f) a surfactant in an amount between about 1.6 to about 2.4 percent by volume of said cleaner.

5,024,781

AZEOTROPE-LIKE COMPOSITIONS OF 1,1-DICHLORO-1-FLUOROETHANE, DICHLOROTRIFLUOROETHANE, METHANOL AND A MONO- OR DI-CHLORINATED C_2 OR C_3 ALKANE

Peter B. Logsdon; Leonard M. Stachura, both of Erie; Ellen L. Swan, Niagara, and Rajat S. Basu, Erie, all of N.Y., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Nov. 13, 1989, Ser. No. 435,923

Int. Cl.[5] C11D *7/30, 7/50*

U.S. Cl. 252—171 **51 Claims**

1. Azeotrope-like compositions consisting essentially of from about 25 to about 98 weight percent 1,1-dichloro-1-fluoroethane, from about 1 to about 69 weight percent dichlorotrifluoroethane selected from the group consisting of 1,1-dichloro-2,2,2-trifluoroethane, 1,2 dichloro-1,2,2-trifluoroethane and a mixture of 1,1-dichloro-2,2,2-trifluoroethane and 1,2-dichloro-1,2,2-trifluoroethane, from about 1 to about 4 weight percent methanol and from about 0.1 to about 4 weight percent of a mono- or di-chlorinated C_2 or C_3 alkane selected from the group consisting of 1I-chloropropane, 2-chloropropane and 1,1-dichloroethane, wherein said compositions with 1 chloropropane or 2-chloropropane boil at about 30.9° C. at 760 mn Hg and said compositions with 1,1-dichloroethane boil at about 29.8° C. at 760 mm Hg.

5,024,782

ZEOLITE AGGLOMERATION PROCESS AND PRODUCT

Leslie E. Finn, Fremont; Donald K. Swatling, El Cerrito, and Erle D. Mankin, Martinez, all of Calif., assignors to The Clorox Company, Oakland, Calif.

Filed Jun. 16, 1989, Ser. No. 367,392

Int. Cl.[5] C11D *7/10, 7/20, 11/00, 17/06*

U.S. Cl. 252—174.13 **7 Claims**

1. A zeolite agglomerate for use as a detergent product, comprising

about 5–70 parts by wgt. zeolite,

about 10–94 parts by wgt. of low absorptivity sodium chloride, and

a binder effective amount of a zeolite binder,

the agglomerate formed therefrom having a particle size range of about 0.15–1.7 mm. and a density of at least about 0.6 gm/cc., the agglomerate further being characterized by mechanical particle strength suitable for resisting substantial particle fracture during transport by a dilute phase pneumatic conveying system and by a nucleus formed from the low absorptivity sodium chloride filler as a seed for the agglomerate with the zeolite and binder forming a shell adhering to the surface of the filler seed.

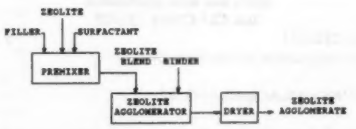
7. A method of forming a granular detergent product, comprising the steps of

blending zeolite particles of about 1–20 micron particle size with a filler to form a zeolite blend,

charging the zeolite blend to a first agglomerator,

spraying a zeolite binder onto the zeolite blend in the first agglomerator with agitation to form a zeolite agglomerate having about 5–70 parts by wgt. zeolite, about 10–94 parts by wgt. to filler, about 1–20 parts by wgt. surfactant, an amount of the zeolite binder effective for agglomerating the zeolite blend and at most about 20 parts by wgt. water,

drying the zeolite agglomerate to remove a portion of the



water and form a dried zeolite agglomerate having a particle size of about 0.15–1.7 mm., a density of at least about 0.60 gm./cc. and characterized by mechanical particle strength sufficient to resist substantial particle fracture during transfer by a dilute phase pneumatic conveying system,

charging the zeolite agglomerate and other detergent components to a second agglomerator to form a detergent composition,

spraying the detergent composition with a detergent binder while agitating the detergent blend to produce a detergent agglomerate having a composition with at most about 20 parts by wgt. water, and

drying the detergent agglomerate to remove a portion of the water and form the detergent agglomerate having a generally uniform particle size and density while being characterized by substantial freedom from segregation and dusting and exhibiting good solubilization and dispersion qualities in aqueous solution.

5,024,783

BOILER AND BOILER WATER TREATMENT SYSTEM

Bruce D. Busch, Shakopee, and Jeffrey R. Nicholls, Prior Lake, both of Minn., assignors to Fremont Industries, Inc., Shakopee, Minn.

Continuation-in-part of Ser. No. 420,117, Oct. 10, 1989. This application Nov. 13, 1990, Ser. No. 611,779

Int. Cl.[5] C02F *5/10*

U.S. Cl. 252—180 **1 Claim**

1. A chemical treatment to be utilized in steam-producing boiler systems providing for the prevention of scale and deposition and further providing for the in-service removal of scale and deposits present in the systems consisting essentially of a composition having the following formulation:

Ingredient	Percent by Weight
Tetrasodium salt of ethylene diamine tetraacetic acid (EDTA) (in 40% aqueous solution)	10%
1-hydroxyethane-1,1-diphosphonic acid (HEDP) (in a 60% active, aqueous solution)	10%

-continued

Ingredient	Percent by Weight
Polyacrylate (in a 50% active, aqueous solution) with a molecular weight of between 2000–6000	10%
Poly (acrylic acid-co-hypophosphite) sodium salt (50% solution) with a molecular weight of between 200–1500	2%
Sodium gluconate	1%
Sodium lignosulfonate	2%
Sodium hydroxide (in a 50% solution) which will normally achieve a boiler pH level of between about 10.5 and 12.5	15%
Water	balance.

5,024,784

DEVICE FOR REVERSIBLE OPTICAL DATA STORAGE USING POLYMERIC LIQUID CRYSTALS

Manfred Eich, Frankfurt am Main, and Joachim Wendorff, Nauheim, both of Fed. Rep. of Germany, assignors to Rohm GmbH Chemische Fabrik, Fed. Rep. of Germany

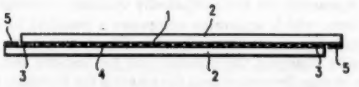
Filed Jul. 8, 1987, Ser. No. 71,192

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1986, 3623395

The portion of the term of this patent subsequent to Jun. 6, 2006, has been disclaimed.

Int. Cl.[5] C09K *19/52*

U.S. Cl. 252—299.01 **16 Claims**



1. A method of reversible optical information storage using a device comprising (i) a substrate, and (ii) a film in an oriented or disoriented state in contact with said substrate, said film comprising a liquid crystalline polymer and photopolymerizable azo, azoxy or carbon-carbon double bond-containing photochromic groups capable of reversible light-induced isomerization, wherein said photochromic groups are contained in the monomers in said liquid crystalline polymer or are present in low molecular weight compounds added to said polymer, comprising the steps of:

(a) writing information in said device by locally reorienting said film by photoisomerizing said photochromic groups in said film, film is in the shape-stable state below the glass temperature of said polymer when the information is; and

(b) reading said stored information by illuminating said film with coherent monochromic light, wherein said film is in the shape-stable state below the glass transition temperature of said polymer during said writing and reading steps.

5,024,785

LIQUID CRYSTAL/RIGID RODLIKE POLYMER MODIFIED EPOXY/VINYL ESTER RESINS

Robert E. Hefner, Jr., Lake Jackson, and Deborah I. Haynes, Freeport, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 17, 1989, Ser. No. 298,432

Int. Cl.[5] C09K *19/52, 19/32;* **C08F** *24/00;* **C08G** *8/30*

U.S. Cl. 252—299.01 **38 Claims**

1. A thermosettable vinyl ester composition containing a polymeric domain containing mesogenic or rigid rodlike moieties which composition is prepared by

(A) copolymerizing

(1) at least one epoxy resin having an average of more than one vicinal epoxy group per molecule wherein from about 0.01 to about 10 mole percent of the epoxide groups have been reacted with at least one compound containing a group reactive with an epoxide group and a polymerizable ethylenically unsaturated group and

(2) at least one polymerizable ethylenically unsaturated monomer, at least one of which contains at least one mesogenic or rigid rodlike moiety;

wherein component (1) is present in an amount of from about 50 to about 99 percent by weight based upon the combined weight of components (1) and (2) and component (2) is present in an amount of from about 1 to about 50 percent by weight based upon the combined weight of components (1) and (2); and then

(B) reacting the resulting copolymer with

(3) one or more polymerizable monounsaturated monocarboxylic acids in an amount which provides a ratio of epoxide groups to carboxylic acid groups of from about 0.7:1 to about 1.5:1.

5,024,786

DETERGENT COMPOSITIONS CONTAINING AN ANIONIC SURFACTANT AND A 4,4'-BIS(TRIAZINYLAMINO)-STILBENE DISULPHONIC ACID OPTICAL BRIGHTENER

John M. Farrar, Rawdon, and Mark D. Graham, Horsforth, both of Great Britain, assignors to Sandoz Ltd., Basel, Switzerland

Filed Oct. 27, 1988, Ser. No. 263,665

Claims priority, application United Kingdom, Oct. 30, 1987, 8725537; Feb. 4, 1988, 8802513; Jun. 7, 1988, 8813415

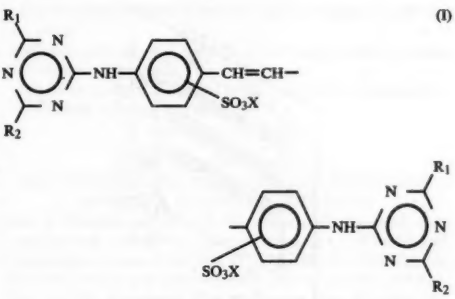
Int. Cl.[5] C11D *3/42, 3/28, 3/34*

U.S. Cl. 252—543 **27 Claims**

1. An aqueous, isotropic liquid detergent composition comprising an aqueous solution of

(a) an anionic surfactant

and (b) and optical brightener of formula I



in which X is hydrogen, NH_4^+, or a cation of an alkali metal, an alkaline earth metal or an organic amine and

R_1 and R_2, independently, are selected from morpholino and anilino unsubstituted or substituted by 1, 2 or 3 groups selected from C_{1-4}alkyl, C_{1-4}alkoxy and halogen; piperidinyl, unsubstituted or substituted by 1 or 2 C_{1-4}alkyl groups; hexamethyleneimino; pyrrolidino; C_{1-8}alkylamino; C_{1-8}dialkylamino; and a 2,2,6,6-tetramethylpiperidinyl residue; provided that at least one R_1 is unsubstituted piperidinyl.

5,024,787

PROCESS FOR THE PREPARATION OF FATTY ACID OR HYDROXY FATTY ACID ESTERS OF ISOPROPYLIDENE DERIVATIVES OF POLYGLYCEROLS

Gerald Jakobson; Werner Siemanowski, both of Rheinberg, and Karl-Heinz Uhlig, Krefeld-Traar, all of Fed. Rep. of Germany, assignors to Deutsche Solvay-Werke GmbH, Solingen, Fed. Rep. of Germany

Filed May 25, 1989, Ser. No. 357,006

Claims priority, application Fed. Rep. of Germany, May 30, 1988, 3818292

Int. Cl.[5] C09F *5/08, 7/10*

U.S. Cl. 260—410.6 16 Claims

1. A process for preparing fatty acid or hydroxy fatty acid esters of an isopropylidene derivative of a polyglycerol, which comprises the steps of:

(a) reacting a C_1–C_4-alkyl ester of a C_6–C_{22}-fatty acid or mono- or polyhydroxy fatty acid, in alkaline medium, with one or more hydroxyl-containing isopropylidene derivatives of a polyglycerol, at a temperature in the range of about 140° to about 220° C., and at a pressure of 950–5 mbar, and removing the resultant C_1–C_4 alcohol by distillation; and

(b) recovering the resultant isopropylidene polyglycerol fatty acid or hydroxy fatty acid esters.

5,024,788

STRUCTURE FOR EFFECTING GAS-LIQUID AND PART THEREOF

Keith Brattan, Great Boughton, United Kingdom, assignor to Imperial Chemical Industries PLC, England

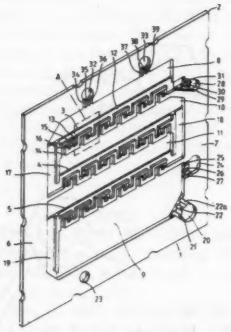
Filed Dec. 1, 1989, Ser. No. 444,790

Claims priority, application United Kingdom, Dec. 2, 1988, 8828221

The portion of the term of this patent subsequent to Jun. 4, 2008, has been disclaimed.

Int. Cl.[5] B01F *3/04*

U.S. Cl. 261—114.1 22 Claims



1. A substantially planar plate, suitable for use in a structure comprising one or more substantially planar plates and in which direct contact may be effected between a gas and a liquid, the said plate comprising a frame part and at least one bridging part between opposite sides of the frame part, the bridging part dividing the plate into upper and lower cavities bounded by the frame part and the bridging part, and one or more apertures through the bridging part leading from the lower cavity to the upper cavity.

5,024,789

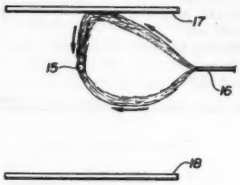
METHOD AND APPARATUS FOR MANUFACTURING ELECTROSTATICALLY SPUN STRUCTURE

John P. Berry, Wirral, England, assignor to Ethicon, Inc., Somerville, N.J. and The University of Liverpool

Continuation-in-part of Ser. No. 257,364, Oct. 13, 1988, abandoned, which is a continuation of Ser. No. 896,789, Aug. 15, 1986, abandoned. This application Jun. 19, 1989, Ser. No. 368,016

Int. Cl.[5] B05B *5/00*

U.S. Cl. 264—6 12 Claims



1. A method of electrostatically spinning a tubular fibrous structure using an electrostatically charged, spinning mandrel and an electrostatically charged grid means in the region of the mandrel to produce an electrostatic field, which method comprises the steps of introducing into said electrostatic field a fiberizable material, collecting on said mandrel a first portion of said liquid in the form of fibers attracted directly to the mandrel and a second portion of said liquid in the form of fibers having been deflected towards said grid means to follow a longer path to said mandrel than the fibers from said first portion of liquid, whereby a tubular fibrous structure is produced having fibers of different diameters and varying fiber orientations.

9. Apparatus for electrostatically spinning a tubular fibrous structure, which apparatus comprises a mandrel to act as a collector for electrostatically spun fibers, means for electrostatically charging the mandrel and for varying the electrostatic charge thereon, means for rotating the mandrel, a pair of grid means in the region of the mandrel with one of said grid means disposed on one side of said mandrel and the other of said grid means disposed on the opposite side of said mandrel, means for electrostatically charging the grid means and for varying the electrostatic charge thereon, and means for introducing a fiberizable material into the electrostatic field, the surface of one of said grid means being closer to said mandrel than the surface of the other of said grid means.

5,024,790

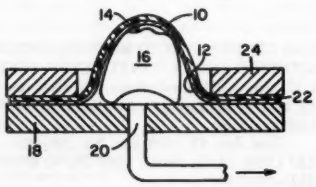
GLAZING DENTAL CONSTRUCTS

David G. Grossman, Corning; Michael A. Karnas, Big Flats, both of N.Y., and Ronald E. Johnson, Tioga, Pa., assignors to Corning Incorporated, Corning, N.Y.

Filed Jul. 9, 1990, Ser. No. 550,288

Int. Cl.[5] A61C *13/09*

U.S. Cl. 264—16 25 Claims



1. A method of glazing a dental construct having a complex surface which comprises associating glazing material with a carrier, the carrier being composed of a highly flexible and

stretchable film or sheet of organic material, assembling the construct and carrier so that the construct is positioned adjacent the carrier, subjecting the assembly to a differential pressure treatment to force the carrier into intimate contact with the construct surface, removing the organic carrier to leave the glazing material on the construct surface, and maturing the glazing material to a glaze on the construct surface.

5,024,791

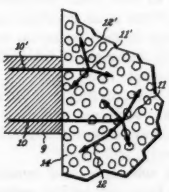
METHOD OF PRODUCING A PHOTOSTIMULABLE X-RAY IMAGE CONVERTOR

Dominic A. Cusano, and Gary W. Yeager, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 111,359, Oct. 22, 1987, abandoned, which is a continuation-in-part of Ser. No. 46,442, May 6, 1987, abandoned. This application Jan. 23, 1989, Ser. No. 300,132

Int. Cl.[5] C09K *11/02;* **B29C** *67/02*

U.S. Cl. 264—21 **8 Claims**



1. A method to form an improved photostimulable storage member for digital radiography enabling recall of a latent radiographic image previously stored by X radiation with a moving beam of stimulating electromagnetic radiation selected from the class of ultraviolet, visible and infrared radiation so that minimal scattering of the moving beam occurs in the storage member beyond the width of the moving beam which comprises:

(a) forming a first solid physical mixture with crystals of a europium activated barium fluorohalide phosphor and a sufficient amount of a chemical compound containing an impurity ion selected from Group 1A and 3A elements in the periodic table of elements for incorporation of 0.3–3.0 weight percent impurity ion based on the weight of phosphor into said phosphor in order to reduce the optical refractive index of said phosphor,

(b) heating said first solid physical mixture causing the impurity ion to selectively diffuse into the phosphor matrix.

(c) forming a second solid physical mixture by combining the treated phosphor crystals with a thermoplastic synthetic organic polymer having an optical refractive index range extending from approximately 1.59 up to approximately 1.69 at the wavelength of stimulating electromagnetic radiation being employed.

(d) subjecting said second solid physical mixture to sufficiently elevated temperature and pressure conditions whereby said polymer is melted and a substantially void-free suspension of said phosphor crystals is formed, and

(e) cooling said molten phosphor suspension to ambient conditions whereby a solid storage member is formed, the storage member being further characterized by having a self-supporting layer configuration with a layer thickness sufficient to absorb 60–70% of the X radiation employed to form a latent radiograpic image therein.

5,024,792

ANTISTATIC THERMOPLASTIC/POLYAMIDE-POLYETHER COMPOSITIONS AND ANTISTATIC POLYMERIC FILMS MADE THEREFROM

Marvin R. Havens, Greer, S.C., assignor to W. R. Grace & Co.-Conn., Duncan, S.C.

Division of Ser. No. 101,909, Sep. 28, 1987, Pat. No. 4,899,521, which is a continuation-in-part of Ser. No. 918,451, Oct. 14, 1986, Pat. No. 4,882,894. This application Oct. 19, 1989, Ser. No. 424,046

The portion of the term of this patent subsequent to Nov. 28, 2006, has been disclaimed.

Int. Cl.[5] B29C *41/00*

U.S. Cl. 264—22 **13 Claims**

1. A method for the manufacture of a film having antistatic characteristics comprising admixing a polyether block amide copolymer having a degree of hydrophilicity suitable for packaging electronic devices with an aromatic sulfonamide antistatic agent, wherein said aromatic sulfonamide is substantially non-hygroscopic and substantially non-migratable, and forming a film having at least one layer of the admixture of polyether block amide copolymer with aromatic sulfonamide.

12. The method of claim 1, further including irradiating said film at a dosage up to about 20 MR.

5,024,793

METHOD FOR MANUFACTURING REFRACTORY OXIDE-CARBON BRICKS

Siegfried Wilkening, Alfter-Oedekoven, Fed. Rep. of Germany, assignor to Vereinigte Aluminum-Werke Aktiengesellschaft, Bonn, Fed. Rep. of Germany

Filed May 9, 1988, Ser. No. 191,607

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1987, 3715178

Int. Cl.[5] C04B *35/64*

U.S. Cl. 264—29.7 **16 Claims**

1. A method for the manufacture of refractory bricks containing refractory oxides and carbon which comprises:

(A) mixing fine-particle refractory oxides with an effective amount of pitch to form a homogeneous green mixture,

(B) coking and calcining said green mixture to form a solid thermally stable sintered product of oxide and carbon,

(C) breaking up said sintered product to form grain fractions,

(D) binding said grain fractions with a mixture of oxide and pitch,

(E) compacting said bonded grain fractions into a green molded article, and

(F) firing said green molded article in a reducing atmosphere to form refractory bricks.

5,024,794

SELF-SUPPORTING CERAMIC STRUCTURES AND METHODS OF MAKING THE SAME

Marc S. Newkirk, and Jerry G. Weinstein, both of Newark, Del., assignors to Lanxide Technology Company, LP, Newark, Del.

Continuation-in-part of Ser. No. 212,072, Jun. 24, 1988, Pat. No. 4,826,643, which is a continuation-in-part of Ser. No. 907,923, Sep. 16, 1986, abandoned. This application Mar. 15, 1988, Ser. No. 168,301

The portion of the term of this patent subsequent to May 2, 2006, has been disclaimed.

Int. Cl.[5] C04B *35/60*

U.S. Cl. 264—57 **21 Claims**

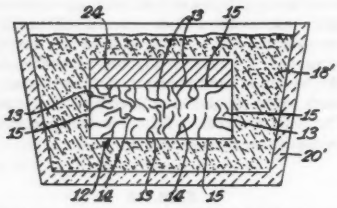
1. A method of producing a self-supporting ceramic structure comprising the steps of:

(a) providing a first self-supporting ceramic body comprising (i) a first polycrystalline oxidation reaction product formed upon oxidation of a first molten parent metal with a first oxidant, and (ii) interconnected porosity at least

partially accessible from at least one surface of said first ceramic body;

(b) orienting a body of second parent metal and said first ceramic body relative to each other so that melting and oxidation reaction of said second parent metal with a second oxidant will cause formation of a second polycrystalline oxidation reaction product in a direction towards and into said interconnected porosity of said first ceramic body, wherein at least one of said first and second oxidant comprises at least one oxidant selected from the group consisting of a liquid oxidant and a solid oxidant; and

(c) heating said second parent metal to a temperature region above its melting point but below the melting points of both the first and second oxidation reaction products to form a body of molten second parent metal and, within said temperature region,



(i) reacting said body of molten second parent metal with said second oxidant to form said second polycrystalline oxidation reaction product;

(ii) maintaining at least a portion of said second oxidation reaction product in contact with and between said body of molten second parent metal and said second oxidant, whereby said second parent metal is drawn through said second polycrystalline material towards the oxidant so that said second oxidant reaction product continues to form at the interface between the second oxidant and previously formed second oxidation reaction product, and

(iii) continuing said reaction for a time sufficient to infiltrate at least a portion of said porosity of said first ceramic body with said second oxidation reaction product.

5,024,795

METHOD OF MAKING SHAPED CERAMIC COMPOSITES

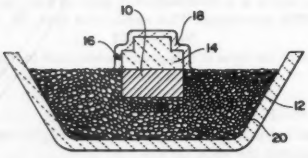
Christopher R. Kennedy, and Marc S. Newkirk, both of Newark, Del., assignors to Lanxide Technology Company, LP, Newark, Del.

Continuation of Ser. No. 207,924, Jun. 13, 1988, Pat. No. 4,824,622, which is a continuation of Ser. No. 945,404, Dec. 22, 1986, abandoned. This application Dec. 6, 1988, Ser. No. 280,717

The portion of the term of this patent subsequent to Apr. 25, 2006, has been disclaimed.

Int. Cl.[5] C04B *33/32, 35/60*

U.S. Cl. 264—59 **8 Claims**



1. A method for producing a self-supporting ceramic composite body comprising a mass of filler material infiltrated by a ceramic matrix, said ceramic matrix being obtained by the oxidation of a parent metal to form a polycrystalline matrix comprising an oxidation reaction product of the parent metal, said method comprising:

(A) heating a parent metal to a temperature above its melting point but below the melting point of its oxidation reaction product to form a body of molten metal;

(B) contacting said body of molten metal with a permeable mass of filler material having at least one surface bearing a stratum, thereby forming an interface between the molten metal and the filler material, said stratum (a) substantially conforming to the geometry of at least a portion of said at least one surface of said mass of filler material, (b) being permeable to a vapor-phase oxidant, (c) comprising an unstabilizable material, and (d) being permeable to infiltration by growth of the oxidation reaction product, and said stratum being at least partially spaced from said interface such that formation of said oxidation reaction product will occur into said mass of filler material and in a direction toward and at least partially into said stratum; and at said temperature:

(i) reacting said molten metal with an oxidant to form an oxidation reaction product,

(ii) maintaining at least a portion of said oxidation reaction product in contact with and between said molten metal and said oxidant, to progressively transport molten metal through the oxidation reaction product toward the oxidant so that fresh oxidation reaction product continues to form at an interface between said oxidant and previously formed oxidation reaction product that has infiltrated said mass of filler material to produce a ceramic composite body, and

(iii) continuing said reacting to infiltrate at least a portion of said stratum with said oxidation reaction product to produce a ceramic stratum overlaying said ceramic composite body; and

(C) recovering a self-supporting ceramic composite body having said at least one surface established by said stratum.

5,024,796

WAVE DISSIPATING CAISSON AND METHOD FOR PRODUCING THEREOF

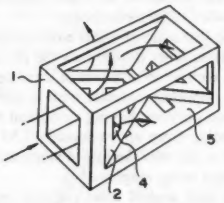
Nobuhiko Iwasa, 26-15, Zempukuji 1-chome, Suginami-ku Tokyo, Japan

PCT No. PCT/JP87/00255, § 371 Date Feb. 21, 1989, § 102(e) Date Feb. 21, 1989, PCT Pub. No. WO88/08469, PCT Pub. Date Nov. 3, 1988

PCT Filed Apr. 21, 1987, Ser. No. 295,970

Int. Cl.[5] E02B *3/06;* B28B *1/08*

U.S. Cl. 264—69 **4 Claims**



1. A method for producing a wave dissipating caisson comprising the steps of:

providing a mold for a bottom plate portion of said caisson;

depositing reinforced concrete into said mold for forming said bottom plate portion;

installing a plurality of steel rods onto said bottom plate portion, said plurality of steel rods extending from said bottom plate portion;

erecting wing frames, right and left side frames, front and

back frames, and an upper frame around said plurality of steel rods, said frames extending from said bottom plate portion along with said plurality of steel rods;

depositing concrete into said frames;

thereby forming said caisson within said frames; and

removing said frames from said formed caisson.

5,024,797

PROCESSES FOR THE PRODUCTION OF MONO- AND MULTIFILAMENTS AND STAPLE FIBERS BASED ON POLYARYLENE SULFIDES

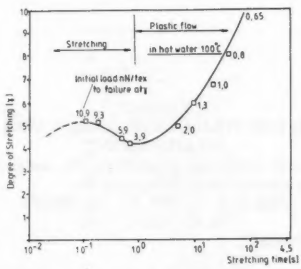
Wolfgang Anderheggen; Michael Kraemer, both of Dormagen; Roland Vogelsgesang, Leverkusen; Wolfram Wagner, Dormagen; Wolfgang Olges, Hilden, and Thomas Dragovic, Pulheim, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 11, 1990, Ser. No. 522,296

Claims priority, application Fed. Rep. of Germany, May 17, 1989, 3916010; Mar. 1, 1990, 4006397

Int. Cl.[5] D01F *6/96*

U.S. Cl. 264—143 **17 Claims**



1. A process for the production of monofilaments and multifilaments based on linear polyarylene sulfide by melt spinning, stretching and setting, wherein

a) uncured granules of polyarylene sulfide having a melt viscosity of 30 to 300 Pa,s, as measured at 306° C. and at a shear rate γ of 1/1,000 sec, are melt spun through a nozzle to form a monofilament or a multifilament,

b) hot air at 50° C. to 150° C., or another inert gas, is blown onto the filaments beneath the nozzle during melt spinning

c) the mono- and multifilaments of the spun material are subjected after spinning to multistage stretching as follows:

1) a first stretching stage avoiding elongation with no significant orientation, in a stretching ratio γ_1 of 2.5 to 5.0, in a water bath with temperatures about 80° C. with residence times at that temperature of 0.1 to 5 seconds,

2) in a second stretching stage, the mono- or multifilaments are afterstretched, in a stretching bath at 80° C. to 100° C. with residence times at that temperature of 0.1 to 10 seconds so that the overall stretching ratio $\gamma_{1,2} = \gamma_1 \cdot \gamma_2 = 3.5$ to 7 and the material is thus partly crystallized and oriented so that

3) in a third stretching stage it can be afterstretched either continuously or discontinuously at temperatures of 150° C. to 260° C. in hot gases with a stretching ratio γ_3 in this stage of more than 1.05 with residence times at these temperatures of longer than 0.1 second to an overall stretching ratio $\gamma_{1,2,3}$ of 3.7 to 11.2 and

d) the mono- and multifilaments, after the multistage stretching, are heatset under tension or in the absence of tension.

5,024,798

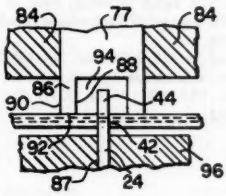
METHOD AND APPARATUS FOR MAKING A JUMPER CONNECTOR

Randy G. Cloud, Painesville, and David A. Pretchel, Madison, both of Ohio, assignors to Minnesota Mining & Manufacturing Company, Saint Paul, Minn.

Division of Ser. No. 901,762, Aug. 28, 1986, Pat. No. 4,869,684. This application Sep. 25, 1989, Ser. No. 411,663

Int. Cl.[5] B29C *41/20, 41/38, 45/14*

U.S. Cl. 264—272.15 **8 Claims**



1. A method of producing in a molding machine a multiconductor electrical cable termination having a plurality of electrical contacts mounted within a base each connected by an electrical junction to the respective conductor of a multiconductor electrical cable, said method comprising the steps of supporting such plurality of electrical contacts within the open mold cavity of such molding machine, placing such multiconductor electrical cable in proper alignment upon such plurality of electrical contacts, forcing the mold parts of the molding machine together simultaneously to close the mold cavity and to form such electrical junctions between such electrical contacts and such respective conductors, the mold parts including a plurality of legs operative during of the mold engage the electrical cable to drive the cable against the electrical contacts to form the electrical junctions between the contacts and respective conductors in the cable, adding a molding material to such closed mold cavity, such mold parts allowing the molding material to flow freely with the material flowing freely between the legs and contacts in the regions of the electrical junctions so that the material surrounds and contains each of the electrical junctions to form such multiconductor electrical cable termination having a hermetically sealed junction zone surrounding each of such electrical junctions, allowing such molding material to solidify, and separating the mold parts of such molding machine to allow the removal of such multiconductor electrical cable termination.

5,024,799

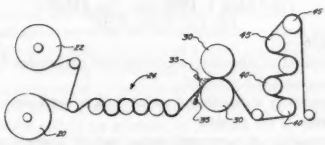
METHOD FOR PRODUCING AN EMBOSSED ORIENTED FILM

Raymond S. Harp, and Donald L. Smith, both of Terre Haute, Ind., assignors to Tredegar Industries, Inc., Richmond, Va.

Division of Ser. No. 205,643, Jun. 13, 1988, which is a continuation-in-part of Ser. No. 95,956, Sep. 14, 1987, abandoned. This application Dec. 19, 1989, Ser. No. 453,821

Int. Cl.[5] B29C *59/04*

U.S. Cl. 264—284 **27 Claims**



1. A method of producing oriented or strength-enhanced embossed film which comprises: introducing into the nip between at least one pair of rotating compression rolls one or

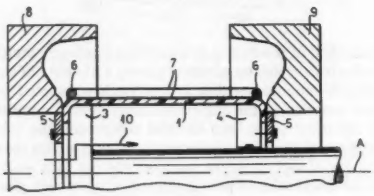
more orientable thermoplastic films having an inert liquid lubricant covering the film surfaces proximate to at least one pair of said compression rolls, the pressure between at least said one pair of compression rolls being sufficient to reduce the thickness of the film(s) and orient the film(s) passing through the nip thereof; and embossing at least one film surface within said nip as the film(s) is oriented.

5,024,800

TIRE-MAKING METHOD

Oskar Schmidt, and Erich Grünner, both of Wien, Austria, assignors to Lim Kunststoff Technologic Gesellschaft M.B.H., Kittsee, Austria

Filed Jan. 16, 1990, Ser. No. 465,737
Claims priority, application Austria, Jan. 18, 1989, 89/89
Int. Cl.[5] B29C *45/14;* B29D *30/18*
U.S. Cl. 264—502 **10 Claims**



1. A method of making a tire comprising the steps of sequentially:

providing a gas-impervious annular liner having a pair of end edges;

clamping each of the edges against a support so as to define between the liner and the support a pressurizable chamber;

fitting a pair of bead rings interconnected by reinforcement over the gas-impervious annular liner to form an annular core assembly having a pair of end edges;

displacing one of the clamped edges toward the other so as to outward bow the liner;

inflating the core assembly through direct contact by introducing gas into the chamber to impart to the core assembly an inwardly open U-shaped section;

spacedly enclosing the U-section core assembly in a mold;

filling the mold around the U-section core assembly with a hardenable elastomer and hardening the elastomer such that the elastomer bonds to the reinforcement, rings, and liner to form a tire; and

deflating and demolding the tire.

5,024,801

REACTOR CORE MODEL UPDATE SYSTEM

Albert J. Impink, Jr., Murrysville; Louis R. Grobmyer, North Huntingdon; Robert E. Sariscak, Monroeville; Toshio Morita, Wilkinsburg, all of Pa., and John L. Duryea, Bay City, Tex., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 1, 1989, Ser. No. 345,872
Int. Cl.[5] G21C *7/36*
U.S. Cl. 376—217 **7 Claims**

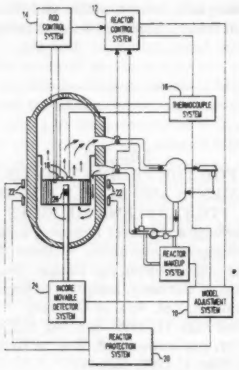
1. A method of updating a core model parameter for a system, comprising the steps of:

(a) calculating a calculated value which correlates to a parameter of the model;

(b) computing a measured value, which correlates to the parameter, from measured system values;

(c) determining a deviation between the calculated value and the measured value;

(d) compensating the parameter when the deviation exceeds a predetermined value; and



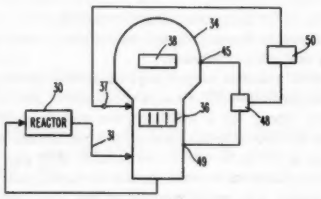
(e) updating the parameter of the model when the parameter is compensated.

5,024,802

METHOD FOR STEAM GENERATOR WATER LEVEL MEASUREMENT

Jagannathan S. Srinivasan, Murrysville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 22, 1990, Ser. No. 600,951
Int. Cl.[5] G21C *17/00*
U.S. Cl. 376—258 **6 Claims**



1. In a nuclear power plant, a method of controlling the steam generator water level, wherein the steam generator has an upper level tap corresponding to an upper level, a lower level tap corresponding to a lower level, a riser positioned between said lower and upper taps, and level sensor means for indicating water level between a first range limit and a second range limit, said sensor means being connected to at least said lower tap, comprising:

calculating a measure of velocity head at about the lower level tap;

calculating a measure of full water level as the upper level less said measure of velocity head;

calibrating said level sensor means to provide an output at said first limit corresponding to an input thereto representative of said measure of full level;

calculating a high level setpoint equal to the level of said riser less a bias amount which is a function of the position of said riser relative to the span between said taps; and

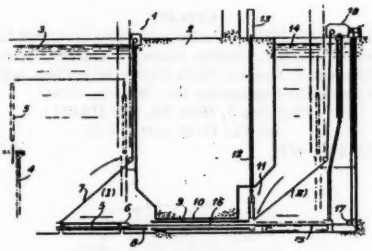
controlling said water level when said sensor means indicates that said high level setpoint has been reached.

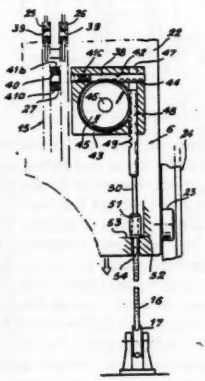
5,024,803

EMERGENCY DEVICE FOR THE CONTROL OF THE DISPLACEMENT FOR A CARRIER CONVEYING A NUCLEAR FUEL ASSEMBLY

Robert Renaudin, 233, rue de Charenton, 75012 Paris, France, and Bruno Tchatalian, 34, rue deu Président Wilson, 78280 Le Pecq, France

Filed Sep. 12, 1989, Ser. No. 406,013
Claims priority, application France, Sep. 14, 1988, 88 11979
Int. Cl.[5] G21C *19/18*
U.S. Cl. 376—270 11 Claims





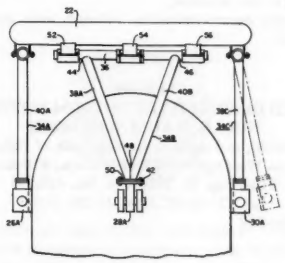
1. An emergency device for control of displacement of a conveying carrier for a nuclear fuel assembly, in which said conveying carrier moves under the effect of a push-pull chain actuated by a driving mechanism selectively causing winding of said chain on itself in spiral so as to pull said carrier, and unwinding of said chain by forming a rigid carrier pushing element, including a connecting member between said chain and said carrier, said connecting member being formed of two portions connected to each other by a pin adapted to be broken when required for disconnecting the two portions and to free the carrier from the chain, wherein the breaking of said pin is due to the effect of traction exerted remotely from said carrier on a control cable, such that, after breaking, the cable can apply a traction on said carrier so as to bring it back freely, independently of said chain, to a predetermined position, the connecting member between said chain and said carrier including a fastening member attached to said carrier and connected to two parallel flanges of a link of said chain by means of a transverse spindle, said fastening member and said spindle being connected by said pin, said pin being parallel to said flanges.

5,024,804

SWINGING SUPPORT FOR NUCLEAR POWER PLANT PRESSURIZER VALVES

Ronald M. Blaushild, Export, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 21, 1989, Ser. No. 383,392
Int. Cl.[5] G21C *13/00*
U.S. Cl. 376—285 5 Claims



1. In a nuclear power plant including a pressurizer having a generally cylindrical vessel wall topped with a dome-like member, a relief and safety valve system having a manifold generally located above and extending about the periphery of the vessel wall of the pressurizer, and an arrangement for supporting the relief and safety valve system, said valve supporting arrangement comprising:

a plurality of lug means extending outwardly from and secured to said vessel wall at points spaced around the wall periphery;

a plurality of columnar support means, each of said columnar support means extending generally vertically upward from each of said lug means to the manifold;

a plurality of first elongated and generally cylindrical structural members extending generally in the horizontal direction for securing the lower end of each of said columnar support means relative to the associated lug means;

a plurality of second elongated and generally cylindrical structural members extending generally in the horizontal direction for supporting the upper end of each of said columnar support means relative to associated collar means;

a plurality of collar means projecting downwardly from said manifold for support of each of said second elongated structural members; and

means for disengaging one of said elongated structural members from its securance so that each of said columnar support means can be pivoted about its other elongated structural member and swung outwardly from said vessel.

5,024,805

METHOD FOR DECONTAMINATING A PRESSURIZED WATER NUCLEAR REACTOR SYSTEM

Alexander P. Murray, Murrysville Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 9, 1989, Ser. No. 391,263
Int. Cl.[5] G21C *9/00*
U.S. Cl. 376—305 13 Claims

1. The method of decontaminating metal surfaces having an oxide coating containing radioactive substances comprising:

providing an aqueous decontamination solution which comprises an aqueous solution of a weak chelating agent capable of forming multiligand complexes with metals, said chelating agent present in an amount of between about 0.1 to 2.0 percent based on the weight of the solution, and a ferrous salt in an amount to provide 50 to 500 parts per million iron based on the weight of the solution; and

passing said decontamination solution over the metal surfaces.

9. A method of dissolving radioactive corrosion products

from the internal metallic surfaces of a pressurized water nuclear reactor comprising:

providing an aqueous decontamination solution which comprises an aqueous solution of a weak chelating agent capable of forming multiligand complexes with metals of said metallic surfaces, said chelating agent present in an amount of between about 0.1 to 2.0 percent based on the weight of the solution, and a ferrous salt in an amount to provide 50 to 500 parts per million iron based on the weight of the solution;

passing said decontamination solution over said metallic surfaces.

5,024,806

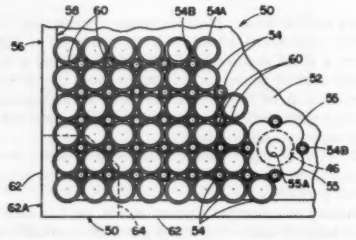
ENHANCED DEBRIS FILTER BOTTOM NOZZLE FOR A NUCLEAR FUEL ASSEMBLY

Joseph V. Cioffi, and John S. Kerrey, both of Columbia, S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 21, 1989, Ser. No. 410,574

Int. Cl.[5] G21C *3/04, 15/00, 19/00*

U.S. Cl. 376—352 10 Claims



1. In a fuel assembly for a nuclear reactor including a plurality of nuclear fuel rods, at last one grid supporting said fuel rods in an organized array, and at least one guide thimble supporting said grid, a debris filter bottom nozzle spaced below said grid and said fuel rods, supporting said guide thimble and adapted to allow flow of liquid coolant into said fuel assembly, said debris filter bottom nozzle comprising:

(a) an enclosure defining a chamber having opposite open ends for coolant flow therethrough in an axial direction from one of said ends to the other of said ends; and

(b) an array of elongated hollow tubes disposed across said chamber of said enclosure in a consolidated side-by-side relation to one another and in abutting contact with one another and rigidly interconnected to said enclosure and to one another to form a unitary structure, said hollow tubes extending substantially parallel to one another and axially in the direction of coolant flow through said chamber;

(c) said array of elongated hollow tubes including a first plurality of tubes of a substantially constant first diameter size and a second plurality of tubes of a substantially constant second diameter size which is smaller than the first diameter size of said first plurality of tubes, said first plurality of tubes being interspersed with said second plurality of tubes in an ordered pattern, said first and second pluralities of elongated hollow tubes being substantially arranged in interconnected structural units wherein each unit includes one tube of said second plurality of tubes in abutting contact with at lest three tubes of said first plurality of tubes, said at least three tubes of said first plurality of tubes being circumferentially arranged around said one tube of said second plurality of tubes and in abutting contact with one another, said first and second pluralities of hollow tubes having hollow tubular cross-sectional configurations defining passages for coolant flow through said chamber, said first diameter size tubes of said first plurality of tubes having passages being of a size smaller than a substantial amount of damage-inducing debris contained in the coolant flow which thereby prevents travel of such debris with the coolant flow through the passages.

5,024,807

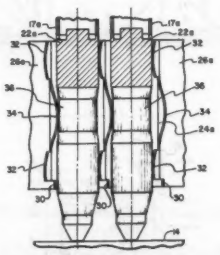
DEBRIS CATCHING SPRING DETENT SPACER GRID

Stephen C. Hatfield, Granby; Mena G. Andrews, Newington, and Richard P. Broders, North Granby, all of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 5, 1988, Ser. No. 279,687

Int. Cl.[5] G21C *3/10, 19/30*

U.S. Cl. 376—352 6 Claims



1. In a nuclear reactor having fuel assemblies including an upper end fitting and a lower end fitting and spaced nuclear fuel rod spacer grids therebetween for supporting and spacing a plurality of elongated nuclear fuel rods, each of which includes a hollow active portion of nuclear fuel filled cladding intermediate the rod ends and a tapering end cap of solid material with a circumferential groove on the rod end which first encounters reactor coolant flow, a tall spacer grid relative to the grids adjacent the active portion being means for capturing and retaining deleterious debris carried by reactor coolant before it enters the active region of a fuel assembly through solid end caps compartments' corners and creates fuel rod cladding damage, comprising in combination:

a polygonal perimeter,

a plurality of fuel end cap compartments defined by pairs of first and second intersection and slottedly interlocked grid-forming strips attached to said perimeter and to each other,

fuel rod end caps each extending into a respective one of said end cap compartments,

at least some of said end cap compartments defined by two pairs of intersecting and slottedly interlocked strips which include integral springs for contact with said end caps in said circumferential grooves and for cooperation with opposing arched portions of said strips also in contact with said end caps,

leaves projecting out of said strips intermediate their intersections, each of said leaves being spaced from the fuel rod end caps and extending into the solid end caps compartments' corners and

each of said leaves being means for enhancing the spacer grid's ability to capture and retain debris in the regions of said solid end caps compartments' corners so that before said debris passing into said regions engages the active portion of the fuel rods it is captures.

5,024,808

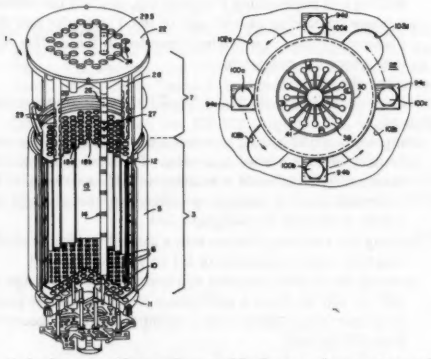
COMBINED SUPPORT COLUMN AND GUIDE TUBE FOR USE IN A NUCLEAR REACTOR

John T. Land, and Ronald J. Hopkins, both of Pensacola, Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 483,302, Feb. 21, 1990, abandoned, which is a continuation of Ser. No. 257,672, Oct. 14, 1988, abandoned. This application Jul. 17, 1990, Ser. No. 553,407

Int. Cl.[5] G21C *7/08*

U.S. Cl. 376—353 14 Claims



1. An improved internals assembly for a nuclear reactor, said assembly including an upper support plate and an upper core plate, each of which includes apertures for conducting control rod assemblies into and out of fuel assemblies, each of the apertures of the upper support plate being aligned with one of the apertures of the upper core plate, wherein the improvement comprises at least one elongated and tubular support and guide tube member whose ends are connected between mutually aligned apertures in said support and core plates for both suspending said core plate from said support plate and for receiving and guiding a control rod assembly through said pair of mutually aligned apertures, and wherein the upper end of the tubular support and guide tube member includes an upper mounting means for detachably mounting said upper end around a selected aperture in the upper support plate, and wherein the improvement further comprises the provision of recesses along the perimeter of said selected aperture that are complementary in shape to the upper mounting means so that when the upper mounting means is detached from said upper support plate and oriented into alignment with said recesses, said support and guide tube member may be withdrawn through said selected aperture.

5,024,809

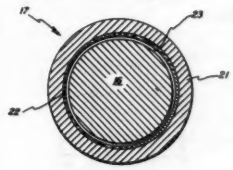
CORROSION RESISTANT COMPOSITE CLADDINGS FOR NUCLEAR FUEL RODS

Dale F. Taylor, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 356,482, May 25, 1989. This application Aug. 1, 1990, Ser. No. 561,135

Int. Cl.[5] G21C *3/00*

U.S. Cl. 376—417 72 Claims



1. A corrosion resistant nuclear fuel element, comprising:

an elongated composite cladding container having a zirconium alloy tube consisting essentially of, by weight percent; 0.5 to 2.0 percent tin, 0.2 to 1.5 percent of a solute composed of molybdenum and tellurium and the balance zirconium, the container having a barrier layer of sponge zirconium metallurgically bonded to the inside surface of the alloy tube, the sponge zirconium being about 1 to 30 percent of the thickness of the alloy tube; and

a central core of a body of nuclear fuel material selected from the group consisting of compounds of uranium, plutonium, thorium and mixtures thereof disposed in and partially filling the container so as to leave a gap between the container and the core and an internal cavity at one end of the container, an enclosure integrally secured and sealed at each end of the container and a nuclear fuel material retaining means positioned in the cavity.

5,024,810

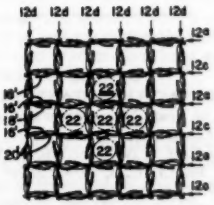
SUPPORT GRID WITH INTEGRAL INCLINED WAVES

William H. Bachman, Simsbury, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed May 22, 1989, Ser. No. 354,709

Int. Cl.[5] G21C *3/34*

U.S. Cl. 376—438 1 Claim



1. In a fuel element support grid for supporting a plurality of nuclear fuel elements intermediate their ends in spaced relation for fluid flow therebetween, said grid including a polygonal perimeter and a plurality of fuel element compartments defined by pairs of first and second intersecting and slottedly interlocked wave defining grid-forming strips attached to said perimeter and to each other, the improvement comprising:

at least some of said strips having its waves defined by bends at spring bases inclined from the vertical and at least some of said strips having spring cantilevered into said compartments from the strips.

5,024,811

METHOD FOR MANUFACTURING DIMENSIONALLY CORRECT COMPACTS

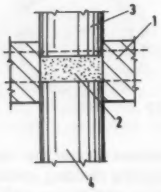
Gerd Hinzmann, Brüggen; Norbert Nies, Neuss, and Siegfried Radewahn, Mönchengladbach, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesllschaft, Dusseldorf, Fed. Rep. of Germany

Filed Jun. 15, 1990, Ser. No. 539,065

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1989, 3919847

Int. Cl.[5] B22F 7/00

U.S. Cl. 419—66 5 Claims



1. A method of producing precision compacts from powdered material in a mold having at least one top plug and at least one bottom plug between which plugs said powdered material is compressed, the method comprising the steps of:

detecting the course of the pressing force of at least one of the plugs as a function of the path of its travel during compression;

comparing said course of pressing force with a predetermined path-dependent tolerance range of the pressing force;

upon exceeding said tolerance range, changing the final pressing position of the plug in question in such a manner that the height of the compact in such final pressing position is reduced by an amount corresponding to the increased springing back of the compact upon its removal from the mold that results from the greater final pressing force; and

in the absence of exceeding said tolerance range, changing the final pressing position of the plug in question in such a manner that the height of the compact in such final pressing position is increased by an amount corresponding to the decreased springing back of the compact upon its removal from the mold that results from the lesser final pressing force.

5,024,812

HYDROCHLORIC ACID RESISTANT STAINLESS STEEL

John H. Culling, St. Louis, Mo., assignor to Carondelet Foundry Company, St. Louis, Mo.

Filed Jul. 2, 1990, Ser. No. 547,034

Int. Cl.[5] C22C 38/42, 38/44

U.S. Cl. 420—49 10 Claims

1. A low nickel content alloy having good resistance to hydrochloric acid comprising:

Nickel	13–20% by weight
Chromium	13–15%
Molybdenum	7–9%
Copper	0.5–3.5%
Manganese	0.2–4.5%
Nitrogen	0.06–0.25%
Carbon	up to about 0.08% maximum
Iron	essentially balance.

5,024,813

MAGNESIUM-TITANIUM TYPE ALLOY AND METHOD FOR PRODUCING THE SAME

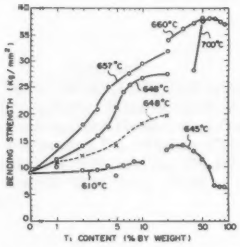
Katsuhiro Nishiyama, 1-89 Edogawadai-Higashi, Nagareyama-shi, Chiba, Japan

Filed Jun. 19, 1989, Ser. No. 368,286

Claims priority, application Japan, Nov. 8, 1988, 63-282182

Int. Cl.[5] C22C 1/04, 1/65, 14/00, 23/00

U.S. Cl. 420—402 3 Claims



1. A process for producing a Mg-Ti type alloy, comprising the steps of:

compounding and mixing at least one of a powder of Ti and a powder of titanium hydride with a powder of Mg, so that the Ti composition in the final product may be in a range of 0.04 to 99.96% by weight;

transferring the resulting mixture along a transfer path while heating and pressurizing it to melt Mg, pouring the molten mixture containing at least one of the Ti powder and the titanium hydride powder incorporated in the molten Mg into a forming mold; and

cooling the mixture.

3. A process for producing a Mg-Ti alloy, comprising the steps of:

compounding and mixing in either a dry manner or in a wet manner at least one of a powder of Ti and a powder of titanium hydride with a powder of Mg, so that the Ti composition in a sintered product may be a range of 0.04% to 99.96% by weight;

forming the resulting mixture into a shape by a compression molding under a pressure of 0.1 to 5 tons/cm^2, and

sintering the formed material at a temperature in a range of 300° to 800° C. from a solid phase to a liquid phase point in an inert atmosphere or in a vacuum under a pressure of 0 to 600 kg/cm^2.

5,024,814

COPPER ALLOY HAVING EXCELLENT HOT ROLLABILITY AND EXCELLENT ADHESION STRENGTH OF PLATED SURFACE THEREOF WHEN HEATED

Rensei Futatsuka; Yutaka Koshiba; Shunich Chiba; Toyoaki Orikasa; Seiji Noguchi, and Takuya Idoshita, all of Aizuwakamatsu, Japan, assignors to Mitsubishi Shindoh Co., Ltd., Tokyo, Japan

Filed Nov. 17, 1989, Ser. No. 438,584

Claims priority, application Japan, Feb. 21, 1989, 1-40908

Int. Cl.[5] C22C 9/04, 9/06

U.S. Cl. 420—473 13 Claims

1. A copper alloy having excellent hot rollability consisting essentially by weight percent of 0.5 to 3% Ni, 0.7 to 2.3% Sn, 0.05 to 0.9% Si, 0.1 to 2% Zn, 0.025 to 0.25% Fe, and the balance being Cu and inevitable impurities, wherein the inevitable impurities include C in an amount of not more than 10 ppm.

5,024,815

COPPER ALLOY WITH PHOSPHORUS AND IRON

Yasusuke Ohashi; Toshihiro Fujino; Yasuhito Taki, and Tamotsu Nishijima, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed May 24, 1989, Ser. No. 356,097
Int. Cl.[5] C22G 9/00
U.S. Cl. 420—487 4 Claims

1. A copper alloy having conductivity equivalent to at least 80% IACS and tensile strength of more than 50 kg/mm^2 consisting essentially of:

(A) 0.15–1.0 wt% Fe,

(B) 0.05–0.3 wt% P, and

(C)

(a) 0.01–0.1 wt% Ni and 0.01–0.05 wt% Si or

(b) 0.01–0.1 wt% Ni and 0.005–0.05 wt% B or

(c) 0.01–0.1 wt% Mn and 0.005–0.05 wt% Si,

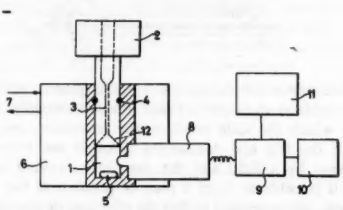
with the balance being essentially composed of Cu.

5,024,816

APPARATUS FOR DETERMINING THE DEGREE OF FRESHNESS OF RAW, FROZEN AND PROCESSED FISH, POULTRY AND MEAT

Kei Arai; Minoru Ohashi, both of Tokyo; Yoshio Utsugi, Hikigun; Osamu Oka, Kawagoe; Kenichi Numazawa, Ageo; Kenji Miwa, Tokorozawa, and Kenzo Sugawara, Yokohama, all of Japan, assignors to Zaidanhojin Shokuhin Sangyo Senta and Oriental Electric Company, Ltd., both of Tokyo, Japan

Continuation of Ser. No. 228,571, Aug. 5, 1988, abandoned, which is a continuation of Ser. No. 874,749, Aug. 6, 1986, abandoned, which is a continuation of Ser. No. 608,972, May 10, 1984, abandoned. This application Dec. 5, 1989, Ser. No. 445,924
Claims priority, application Japan, May 16, 1983, 58-84149
Int. Cl.[5] G01N 7/00
U.S. Cl. 422—68.1 1 Claim



1. Apparatus for determining the degree of freshness of raw, frozen and processed perishable foodstuffs by measuring a consumption of dissolved oxygen by the foodstuffs during a predetermined time period sufficient for the consumption to occur, comprising:

a temperature controlled reaction cell having an opening;

a removable stopper hermetically sealing the opening, said stopper having an open, a capillary extending therethrough for liquid injection; and

an oxygen sensor mounted for measuring a value of dissolved oxygen in said cell,

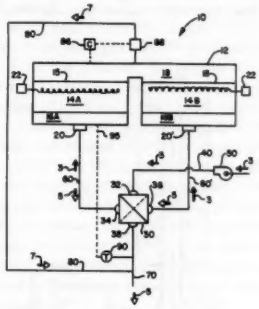
wherein said capillary has a minimum diameter of substantially 1 millimeter which is sufficiently small so that oxygen diffusion through said capillary during said time period is substantially zero, whereby measurements by said oxygen sensor are not affected.

5,024,817

TWIN BED REGENERATIVE INCINERATOR SYSTEM

Glenn D. Mattison, Wellsville, N.Y., assignor to The Air Preheater Company, Inc., Wellsville, N.Y.

Filed Dec. 18, 1989, Ser. No. 451,697
Int. Cl.[5] G05D 7/00
U.S. Cl. 422—111 3 Claims



1. A regenerative bed incinerator system for treating combustible contaminants in a process gas stream, comprising:

a. incinerator means for receiving the contaminated process gas stream, preheating the contaminated process gas stream, incinerating the combustible contaminants in the preheated process gas stream, cooling the incinerated process gas stream, and discharging the cooled incinerated process gas stream, said incinerator means having a first gas permeable bed disposed in spaced relationship with a second gas permeable bed, and an unfired and uncooled dwell chamber disposed therebetween, each of said first and second gas permeable beds being formed of a particulate material having heat-accumulating and heat-exchanging properties; and

b. gas flow directing means operatively associated with said incinerator means for receiving the contaminated process gas stream, alternately directing the contaminated process gas stream to and through said incinerator means in opposite, alternate directions so as to periodically reverse the direction of gas flow through said incinerator means, and for receiving a cooled incinerated process gas stream from said incinerator means and discharging said cooled incinerated process gas stream, whereby said first and second gas permeable beds alternate in function with the one of said gas permeable beds which is upstream with respect to gas flow being a contaminated process gas preheating bed and the one of said gas permeable beds which is downstream with respect to gas flow being an incinerated process gas cooling bed.

5,024,818

APPARATUS FOR FORMING CARBON FIBERS

Gary G. Tibbetts, Birmingham; Daniel W. Gorkiewicz, Washington, and Dean C. Hammond, Jr., Birmingham, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 9, 1990, Ser. No. 594,540
Int. Cl.[5] B01J 19/24
U.S. Cl. 422—158 9 Claims

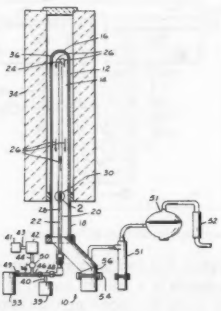
1. An apparatus for forming carbon fibers by a continuous gas phase process comprising reaction of a gaseous carbonaceous compound in the presence of nuclei entrained in a gas stream, said apparatus comprising:

(a) a reactor defining a reaction chamber having a vertical axis, a closed upper end and a lower outlet,

(b) a reactant feed tube having an opening spaced from the reactor closed end, said feed tube extending generally axially upwardly within the reactor, whereupon said feed

tube and said reactor cooperate to define a gas flow path that extends generally axially upward through the feed tube into the chamber and thereafter generally axially downward through the chamber,

(c) means for heating the reactor to establish a hot zone within the reaction chamber adjacent the closed end thereof at a temperature sufficient to sustain carbon fiber growth and a relatively cool zone adjacent the reactor outlet, thereby establishing a thermal gradient within the reactor that minimizes convective currents therewithin,



(d) means for continuously supplying a gaseous reactant stream comprising nuclei into the feed tube at a rate sufficient to entrain the nuclei within the gas stream for dispersion into the reactor hot zone, said reactor chamber having an average cross sectional area greater than said feed tube to accommodate said gas stream at a reduced downward flow rate suitable for sustained fiber growth, and

(e) means for collecting carbon fibers from exhaust gas exiting the reactor outlet.

5,024,819

APPARATUS FOR THE SURFACE TREATMENT OF SHEET-LIKE STRUCTURES BY ELECTRIC CORONA DISCHARGE

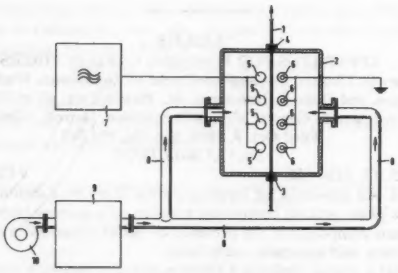
Peter Dinter, Oestrich-Winkel; Hermann Funke, Altoetting, and Klaus Matschke, Burgkirchen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 31, 1990, Ser. No. 473,257

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1989, 3903235

Int. Cl.[5] B01J *19/08*

U.S. Cl. 422—186.06 **5 Claims**



1. An apparatus for the surface treatment of a sheet-shaped or web-shaped substrate by means of electric corona discharge, comprising: a corona discharge device consisting of a generator; high voltage electrodes; to which a high frequency alternating current of high voltage can be applied by said generator; and grounded counter electrodes, arranged at a distance from said high voltage electrodes; an atomizer device for the atomization of liquid into a suspendable aerosol, which is connected to said corona discharge device via a transport line for the aerosol; and a blower, which can be regulated in the rate of throughput, is connected to said atomizer device and conveys the carrier gas for the aerosol through the atomizer device and the transport line to the corona discharge device, wherein said high voltage electrodes and said counter electrodes together form a gap, which is higher than the thickness of the substrate to be treated, on both opposite surfaces of which the carrier gas/aerosol mixture acts in the gap without direct or indirect contact with the electrodes and counter electrodes.

5,024,820

MECHANISM FOR CHARGING AND DISCHARGING A CLOSED CHAMBER UTILIZABLE AS AN EXTRACTION TANK OF A CONTINUOUS VEGETABLE MATERIAL EXTRACTION UNIT AND EXTRACTION PROCESS COMPRISING AN APPLICATION THEREOF

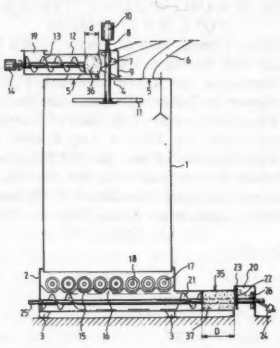
Dominique Coutiere, Labrit, France, assignor to Biolandes, Labrit, France

Filed Oct. 18, 1988, Ser. No. 259,140

Claims priority, application France, Oct. 19, 1987, 87 14353; Oct. 19, 1987, 87 14354

Int. Cl.[5] B01D *11/02*

U.S. Cl. 422—261 **22 Claims**



1. Mechanism for charging and discharging a closed chamber utilizable as an extraction tank of a continuously operating unit in which the solid products for processing are charged through the top and discharged through the bottom after processing by a fluid and the evacuation system of which makes it possible to form a plug of product at the point of discharge, characterized in that the charging device comprises a complementary means designed to compress the product for processing to form a plug before it is introduced into the processing chamber (1), the plugs formed by the compressed product both at the point of charging and at the point of discharge being sufficiently tight to maintain inside the said chamber liquid or gaseous processing fluids.

5,024,821

SOLVENT EXTRACTION PROCESS

James N. Greenshields, Hockessin, Del., and Peter E. Tetlow, Phoenix, Ariz., assignors to ICI Americas Inc., Wilmington, Del.

Filed Feb. 28, 1990, Ser. No. 486,494

Int. Cl.[5] C01G *43/00*

U.S. Cl. 423—23 **28 Claims**

1. A solvent extraction process of the recovery of a metal

from an aqueous solution thereof which includes a stage in which the aqueous solution is contacted, in the presence of a wetting agent, with a solution of an extracting agent in a water-immiscible organic solvent.

5,024,822

STABILIZATION OF FLUORIDES OF SPENT POTLINING BY CHEMICAL DISPERSION

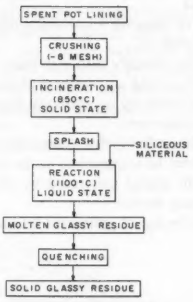
Herman J. Hittner, Lower Burrell, Pa., and Quyen C. Nguyen, Newburgh, Ind., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 174,863, Mar. 29, 1988, Pat. No. 4,956,158. This application Mar. 30, 1990, Ser. No. 502,185

The portion of the term of this patent subsequent to Sep. 11, 2007, has been disclaimed.

Int. Cl.[5] C01F *7/02*

U.S. Cl. 423—111 **24 Claims**



1. A process for treating spent potlining from the electrolytic smelting of aluminum comprising:

(a) incinerating spent potlinking at a temperature low enough to maintain a fluorine vapor pressure lower than about 5 mm Hg and high enough to combust carbonaceous material in the potlining to form an ash;

(b) admixing siliceous material with said potlining either before or after said ash-forming step; and

(c) heating said ash and siliceous material to form a glassy residue suitable for landfill.

5,024,823

COPPER SULFATE ABSORPTION MASS TO REMOVE ASH_3, PH_3, B_2H_6, GEH_4 AND SIH_4

Cetin Gökcek, Muhlheim, Fed. Rep. of Germany, assignor to Messer Griesheim GmbH, Fed. Rep. of Germany

Filed Dec. 5, 1988, Ser. No. 279,851

Int. Cl.[5] B01D *47/00;* **B01J** *8/00;* **C01B** *3/00*

U.S. Cl. 423—210 **10 Claims**

1. A process to eliminate gases selected from the group consisting of AsH_3, PH_3, B_2H_6, GeH_4 and SiH_4 including the steps of forming an absorption mass by saturating a porous carrier in the form of silica gel or aluminum oxide with $CuSO_4$ in the form of monohydrate or $CuSO_4$ free from water of crystallization, contacting the gases with the absorption mass, and absorbing the gases in the absorption mass.

5,024,824

LAYERED AUTOMOTIVE CATALYTIC COMPOSITE

Michael G. Henk, and Jack C. Summers, II, both of Tulsa, Okla., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Division of Ser. No. 201,245, Jun. 1, 1988, Pat. No. 4,868,148, which is a continuation-in-part of Ser. No. 88,745, Aug. 24, 1987, abandoned. This application Jul. 25, 1989, Ser. No. 384,534

Int. Cl.[5] B01D *53/36*

U.S. Cl. 423—213.5 **17 Claims**

1. A process for minimizing the content of hydrogen sulfide in an automotive exhaust gas which comprises contacting said exhaust gas with the catalytic composite comprising a first support which is a refractory inorganic oxide selected from the group consisting of alumina, silica, titania, zirconia, aluminosilicates and mixtures thereof, having dispersed thereon at least one noble metal component selected from the group consisting of platinum, palladium, rhodium, ruthenium, and iridium substantially in the absence of an oxygen storage component and having dispersed immediately thereon an overlayer separated from said noble metal component comprising at least one oxygen storage component which is an oxide of a metal selected from the group consisting of iron, nickel, cobalt, and the rare earths and optionally a second support which is a refractory inorganic oxide.

5,024,825

PROCESS FOR THE PREPARATION OF DICALCIUM PHOSPHATE

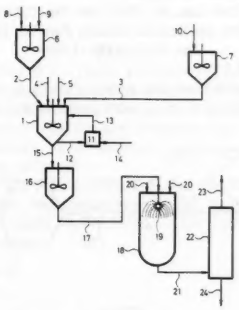
Horst Buhl; Josef Holz, and Franz-Josef Dany, all of Erftstadt, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed May 10, 1990, Ser. No. 521,737

Claims priority, application Fed. Rep. of Germany, May 13, 1989, 3915746

Int. Cl.[5] C01B *15/16, 25/26*

U.S. Cl. 423—309 **8 Claims**



1. A process for the preparation of dicalcium phosphate dihydrate stabilized with dimagnesium phosphate trihydrate and sodium pyrophosphate, which comprises introducing an aqueous suspension of calcium carbonate into a reactor equipped with a stirrer and recirculating it by pumping at 3,500 to 8,000 rpm through a high-speed mixer flow-connected with a lower and upper portion of the reactor; introducing into the mixer an amount of phosphoric acid at least sufficient for the quantitative formation of dicalcium phosphate dihydrate; then introducing into the reactor an oxygen-containing magnesium compound; metering into the reactor lime milk having a $Ca(OH)_2$ content of 10 to 30% by weight up to a maximum pH of 6.9, before adding the sodium pyrophosphate to the reactor; finally atomizing the resulting suspension having a content of 20 to 33% by weight of stabilized dicalcium phosphate dihydrate by means of an atomizer wheel, and spray-drying the

atomized suspension by means of co-current hot air having a temperature of 150° to 350° C.

5,024,826

SILICA PARTICULATE COMPOSITION

Howard R. Linton, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 5, 1990, Ser. No. 489,273
Int. Cl.[5] C01B *33/18*
U.S. Cl. 423—335 7 Claims

1. A silica powder composition in which the powder particles have an average size of from 0.05 to 15 microns, a specific surface area of from 25 to 400 m^2/g, and consist essentially of a shell of amorphous hydroxylated silica having a shape and a thickness in the range of from 10 to 50 nanometers.

5,024,827

FINE PARTICULATE MATERIAL

William J. Jones, Middlesbrough, and Ian P. Appleyard, Stockton on Tees, both of England, assignors to Tioxide Group, PLC, England

Filed May 30, 1989, Ser. No. 357,793
Claims priority, application United Kingdom, May 28, 1988, 8812759
Int. Cl.[5] C01G *23/047*
U.S. Cl. 423—610 9 Claims

1. Fine particulate material consisting essentially of titanium dioxide the particles of which have a cross-section which is substantially rectangular so that the particles have a width to length ratio of at least 0.8:1.0 and that the particles have an average particle size of from 10 nm to 250 nm.

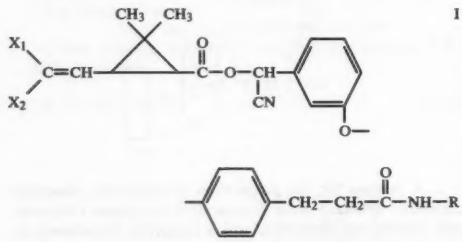
5,024,828

NOVEL RADIOACTIVE PYRETHRINOIDS AND USE THEREOF

Jean-Pierre Demoute, Montreuil-sous-Bois; Gaëtan Touyer, and Michel Mouren, both of Paris, all of France, assignors to Roussel Uclaf, Paris, France

Filed Jan. 28, 1987, Ser. No. 7,648
Claims priority, application France, Jan. 29, 1986, 86 01220
Int. Cl.[5] A61K *43/00*
U.S. Cl. 424—1.1 10 Claims

1. The optical isomers and racemic mixtures of novel radioactive pyrethrinoids marked with iodine of the formula

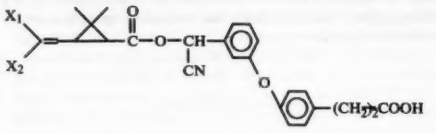


I

wherein X_1 is selected from the group consisting of halogen and $—CF_3$, X_2 is a halogen, RNH is the residue of a member selected from the group consisting of histidine, tyrosine, histidinol, histamine, tyramine and methyl tyrosinate marked with iodine^{125} or iodine^{131}.

5. In a process for the radioimmunological determination of pyrethrinoid esters of α-cyano-3-phenoxy-benzyl alcohol in biological fluids of man and warm-blooded animals, the improvement comprising using a compound of claim 1 of the pyrethrin as the said ester as reagent.

7. An antigen formed by conjugating through the carboxyl group a compound of the formula



II

with and immunogenic protein wherein X_2 is halogen and X_1 is halogen or $—CF_3$.

5,024,829

METHOD OF IMAGING CORONARY THROMBI

Harvey J. Berger, Devon, Pa.; Jamshid Maddahi, and Daniel Berman, both of Beverly Hills, Calif., assignors to Centocor, Inc., Malvern, Pa., by said Harvey J. Berger

Filed Nov. 21, 1988, Ser. No. 274,383
Int. Cl.[5] A61K *49/02, 39/395*
U.S. Cl. 424—1.1 12 Claims

1. A method of imaging a coronary thrombus in a patient, comprising the steps of:

a. administering directly into a cornary artery of a patient suspected of having an coronary thrombus a radiolabeled monoclonal antibody or antibody fragment specific for a thrombus component;

b. allowing the radiolabeled monoclonal antibody or antibody fragment to accumulate at the thrombus site;

c. detecting the signal generated by the radiolabel with a photoscanning device;

d. converting the signal generated into a visual image of the thrombus.

5,024,830

METHOD FOR CRYOPREPARING BIOLOGICAL TISSUE FOR ULTRASTRUCTURAL ANALYSIS

John G. Linner, Houston, Tex., assignor to The Board of Regents, The University of Texas, Austin, Tex.

Division of Ser. No. 926,985, Nov. 4, 1986, Pat. No. 4,799,361, which is a continuation-in-part of Ser. No. 770,772, Aug. 29, 1985, Pat. No. 4,676,070, which is a continuation-in-part of Ser. No. 525,626, Aug. 23, 1983, Pat. No. 4,510,169. This application Aug. 9, 1988, Ser. No. 230,768
Int. Cl.[5] G01N *1/30;* A01N *1/02*
U.S. Cl. 424—3 2 Claims

1. A method of cryopreparing biological tissue which comprises:

(a) rapidly cooling said tissue at a rate and to a temperature sufficient to vitrify the water in said tissue; and

(b) removing said water from said tissue by vaporization directly from its vitrified state.

2. A method of cryopreparing biological tissue which comprises:

(a) rapidly cooling said tissue at a rate and to a temperature sufficient to vitrify the water in said tissue;

(b) subjecting said tissue containing said vitrified water to a combination of vacuum and temperature conditions at which said water is capable of vaporizing directly from its vitrified state; and

(c) slowly adding energy to and in a quantity sufficient to dehydrate said tissue by vaporizing said vitrified water directly from said vitrified state.

5,024,831

POWDERY COSMETIC CONTAINING CELLULOSE POWDER IMPREGNATED WITH MOISTURIZING POLYMER

Hideo Kurisaki, and Masahiko Nishikawa, both of Kumamoto, Japan, assignors to Chisso Corporation, Japan

Filed Nov. 3, 1989, Ser. No. 431,249
Int. Cl.[5] A61K *7/02*
U.S. Cl. 424—69 11 Claims

1. A powdery cosmetic comprising:

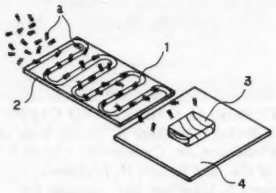
a spherical cellulose powder having an average particle diameter of at least 3 μm and present in an amount of 0.1 to 50% by weight based on the total weight of powdery cosmetic, said spherical cellulose powder coated, impregnated, or chemically linked with at least one high molecular weight moisture retentive substance selected from the group consisting of hyaluronic acid, chondroitin sulfuric acid, collagen, collagen hydrolyzate, elastin, elastin hydrolyzate, fibronectin and salts and derivatives of the aforementioned.

5,024,832

TERMITES TRAIL-FOLLOWING PHEROMONE AND A SAME COMPOSITION AND METHOD OF DETECTING CAPTURED TERMITES BY USING THIS COMPOSITION

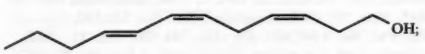
Tetsuo Omata; Shuji Senda; Tamaki Tanaka; Eriko Kumagai; Chikara Kajimoto, and Yutaka Nakazono, all of Osaka, Japan, assignors to Nitto Denko Co. Ltd., Osaka, Japan

Filed Dec. 13, 1989, Ser. No. 450,112
Claims priority, application Japan, Dec. 27, 1988, 63-334090; Apr. 1, 1989, 1-96998
Int. Cl.[5] A01N *25/00, 25/08, 31/00*
U.S. Cl. 424—84 2 Claims



1. A termite trail-marking composition, comprising:

(a) (3Z,6Z,8E)-dodecatrienol of formula (1)



(1)

and (b) at least one member selected from the group consisting of n-hexanoic acid, p-hydroxysilicic acid, vanillic acid, protocatequinic acid, p-hydroxybenzoic acid, β-carotene and 3-hexen-1-ol.

5,024,833

COMBINED INTERFERON/ANTIESTROGEN THERAPY FOR TREATMENT OF BREAST CANCER

Sergio Del Bianco, and Gigliola Sica, both of Rome, Italy, assignors to Industria Farmaceutica Serono SPA, Italy

Continuation of Ser. No. 170,106, Mar. 10, 1988, abandoned, which is a continuation of Ser. No. 917,407, Oct. 10, 1986, abandoned. This application May 30, 1989, Ser. No. 358,475
Int. Cl.[5] A61K *37/66*
U.S. Cl. 424—85.4 13 Claims

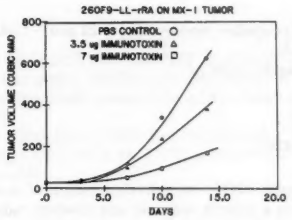
1. A method of inhibiting the proliferation of breast cancer cells which comprises sequentially administering to a host in need thereof an effective inhibiting amount of a combination of beta interferon and temoxifen wherein the interferon is administered intramuscularly in an amount of 2 to 10 million international units and temoxifen is orally administered in a daily amount of about 30 milligrams.

5,024,834

THIOETHER LINKED IMMUNOTOXIN CONJUGATES

L. L. Houston, Oakland; Lois Aldwin, San Mateo, and Danute E. Nitecki, Berkeley, all of Calif., assignors to Cetus Corporation, Emeryville, Calif.

Division of Ser. No. 217,938, Jul. 12, 1988, abandoned. This application Oct. 15, 1990, Ser. No. 597,081
Int. Cl.[5] A61K *39/44;* C07K *17/02*
U.S. Cl. 424—85.91 5 Claims



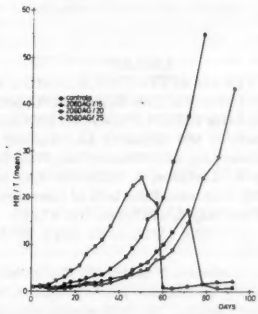
1. A method of killing cells, comprising contacting said cells with an immunotoxin consisting of at least one antibody and at least one cytotoxin linked by a thioether linkage by reaction with a linker comprising maleimido-6-aminocaproyl-spacer-glutaryl ester of 1-hydroxy-2-nitrobenzene.

5,024,835

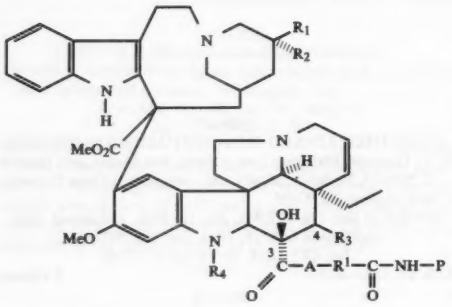
CONJUGATES OF A VINCA DERIVATIVE CARRYING A DETERGENT CHAIN IN THE C-3 POSITION

KSP Siva Bhushana Rao, Rosieres; Jean-Paul Dejonghe, Wawre; Marie-Paule Collard, Brussels, and Andre Trouet, Winksele-Herent, all of Belgium, assignors to Ire-Celltarg S.A., Fleurus, Belgium

Filed Feb. 3, 1989, Ser. No. 306,639
Claims priority, application France, Feb. 8, 1988, 88 01439
Int. Cl.[5] A61K *39/44, 37/36, 37/04;* C07K *17/00*
U.S. Cl. 424—85.91 16 Claims



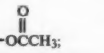
1. A conjugate of a vinca (indole-dihydroindole) derivative having a formula



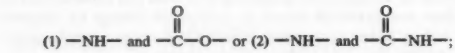
in which

R_1 and R_2 together represent (1) —Et and —OH or (2) —H and —Et;

R_3 represents —OH or



A represents —NH— or a divalent radical of an amino acid found in a protein, wherein said divalent radical of said amino acid is terminated by



R' represents an aliphatic hydrocarbon radical having at least 7 aliphatic carbon atoms; and

—NH—P represents a radical derived from NH_2P, wherein NH_2P represents a macromolecular carrier of polypeptide origin in which said NH_2 represents a free amino group.

5,024,836

STABLE LYOPHILIZED LIVE HERPES VIRUS VACCINE

William J. McAleer, Avalon, N.J.; Robert Z. Maigetter, Mechanicsville, and Henry Z. Markus, Wyncote, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 183,530, Apr. 14, 1988, abandoned, which is a continuation-in-part of Ser. No. 45,940, May 4, 1987, abandoned. This application Oct. 19, 1989, Ser. No. 423,658

Int. Cl.[5] A61K *39/12*; C12N *7/00*

U.S. Cl. 424—89 **8 Claims**

1. A gas injected lyophilized live attenuated varicella virus vaccine which comprises 2% to 8% moisture.

5,024,837

COLEOPTERAN ACTIVE MICROORGANISMS, RELATED INSECTICIDE COMPOSITIONS AND METHODS FOR THEIR PRODUCTION AND USE

William P. Donovan, 650 Bayberry La., Yardley, Pa. 19067; Jose M. Gonzalez, Jr., 2211 Country La., West Trenton, N.J. 08628; Barry L. Levinson, 1 Millbrook La., and Anthony Macaluso, 2295 Princeton Pike, both of Lawrence, N.J. 08648

Filed May 6, 1987, Ser. No. 47,945

Int. Cl.[5] C12N *15/00, 1/20*; A61K *33/74*

U.S. Cl. 424—93 **12 Claims**

1. A *Bacillus thuringiensis* bacterium that produces protein endotoxins having insecticidal activity against lepidopteran and coleopteran insects, the coleopteran-active endotoxin being produced by an acquired coleopteran toxin-encoding plasmid that is characteristic of *Bacillus thuringiensis* strain EG2158, deposited with the NRRL and assigned NRRL Accession No. B-18213.

5,024,838

COMPOSITIONS FOR THE TREATMENT OF SKIN INJURIES

Vicente Parrilla, Avenida Emperadores No. 132, Colonia Portales, 3300 Mexico City, Mexico

Filed May 10, 1988, Ser. No. 192,350

Claims priority, application Mexico, Mar. 2, 1988, 10622

Int. Cl.[5] A61K *37/54, 31/705, 9/70*

U.S. Cl. 424—94.65 **7 Claims**

1. Composition for the treatment of skin injuries, comprising a local antiseptic, in a ration of 0.005 to 0.5 parts; a sapogenin, in a ratio of 0.005 to 0.5 parts; a proteolytic enzyme in a ration of 0.005 to 0.5 parts; and a suitable vehicle in a range to adjust to 100 parts of the composition,

wherein the sapogenin is filiferin.

5,024,839

DACTYLOCYCLINE A AND DACTYLOCYCLINE B

Carol A. Aklonis, Lawrenceville; Helen A. Ax, Hopewell; Donald R. Kirsch, Princeton; Joseph O'Sullivan, Belle Mead; Adrienne Tymiak, Hopewell, and J. Scott Wells, Ringoes, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Dec. 24, 1987, Ser. No. 137,635

Int. Cl.[5] H61K *35/70*

U.S. Cl. 424—115 **2 Claims**

1. Dactylocycline A, which has the infrared spectrum in potassium bromide as shown in FIG. 1, the fast bombardment mass spectrum in the positive ion mode as shown in FIG. 2, the fast bombardment mass spectrum in the negative ion mode as shown in FIG. 3, the 67.5 MHz ^{13}C NMR spectrum as shown in FIG. 4, and the 400 MHz ^{1}H NMR spectrum as shown in FIG. 5.

5,024,840

ANTIMICROBIAL CARPET AND CARPET TILE

Lawrence W. Blakely; Michael A. Howe, both of LaGrange; Daniel F. Pinholster, Jr., Cartersville; Claude E. Terry, Kennesaw, all of Ga., and Robert H. McIntosh, Sr., Greensboro, N.C., assignors to Interface, Inc., Atlanta, Ga.

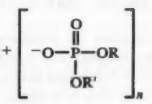
Continuation-in-part of Ser. No. 190,370, May 5, 1988, which is a continuation-in-part of Ser. No. 47,561, Apr. 27, 1987, which is a continuation-in-part of Ser. No. 781,710, Oct. 2, 1985, abandoned, Ser. No. 635,728, Oct. 9, 1984, abandoned, Ser. No. 713,445, Mar. 19, 1985, abandoned, Ser. No. 736,652, Apr. 21, 1985, Pat. No. 4,647,601, Ser. No. 744,730, Jun. 13, 1985, abandoned, each is a continuation-in-part of Ser. No. 570,952, Mar. 8, 1984, Pat. No. 4,608,289, which is a continuation of Ser. No. 523,734, Aug. 16, 1983, abandoned, which is a continuation of Ser. No. 226,006, Jan. 19, 1981, abandoned, which is a continuation of Ser. No. 930,879, Aug. 4, 1978, abandoned, Ser. No. 352,060, May 15, 1989, Continuation-in-part of Ser. No. 224,057, Jul. 25, 1988. This application May 15, 1989, Ser. No. 352,060

Int. Cl.[5] A01N *25/34*

U.S. Cl. 424—404 **22 Claims**

1. An antimicrobial carpet comprising fibers attached to a primary backing with a primary adhesive that includes:

(i) a biocidally effective amount of a phosphoric acid ester of the general formula:



wherein R and R' are alkyl, oxyalkyl, polyoxyalkyl, aryl, aralkyl or alkaryl groups of C_1 to C_{24}, and one of R or R' can be H; X is a Group I metal ion, Group II metal ion, transition metal ion, or $NY_1Y_2Y_3Y_4$, where Y_{1-4} are hydrogen, a hydrocarbon of C_1 to C_{24}, or a hydroxyalkyl group of C_1 to C_{24}; and there is at least one free hydroxyl group; and when X is $NY_1Y_2Y_3Y_4$ or a Group I metal ion, n is 1, when X is a Group II metal ion, n is 2; and when X is a transition metal, n is equal to the valence of the metal; and

(ii) a latex polymer; and

wherein the phosphoric acid ester or its salt is capable of migration from the primary adhesive to the fibers.

5,024,841

COLLAGEN WOUND HEALING MATRICES AND PROCESS FOR THEIR PRODUCTION

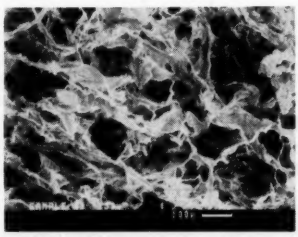
George H. Chu, Sunnyvale; Yasushi Ogawa, Pacifica, both of Calif.; John M. McPherson, Hopkinton, Mass.; George Ksander, Redwood City, Calif.; Bruce Pratt, Union City, Calif.; Diana Hendricks, Brea, Calif., and Hugh McMullin, San Bruno, Calif., assignors to Collagen Corporation, Palo Alto, Calif.

Filed Jun. 30, 1988, Ser. No. 213,726

The portion of the term of this patent subsequent to Aug. 21, 2007, has been disclaimed.

Int. Cl.[5] A61F *13/00*; A61K *9/14, 37/12, 31/725*

U.S. Cl. 424—422 18 Claims



1. A collagen implant, comprising:

a matrix having a density of about 0.01 to about 0.3 g/cm^3, a thickness of about 1–20 mm, and having pores at least 80% of which are at least 35 μm in diameter, wherein said matrix comprises

fibrillar atelopeptide collagen, wherein said fibrils are about 50–200 nm in diameter, and are not chemically cross-linked.

5,024,842

ANNEALED COATS

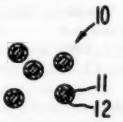
David E. Edgren, El Granada, and Felix Theeuwes, Los Altos, both of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 187,621, Apr. 28, 1988, Pat. No. 4,931,285. This application Apr. 2, 1990, Ser. No. 503,004

The portion of the term of this patent subsequent to Jun. 5, 2007, has been disclaimed.

Int. Cl.[5] A61K *9/24*

U.S. Cl. 424—473 2 Claims



1. A dosage form for delivering a drug to a fluid environment of use, the dosage form comprising:

(a) a wall comprising an annealed subcoat and overcoat, said subcoat and overcoat annealed at about 20° C. to 75° C. for about 5 to 90 hours; and wherein;

(1) the subcoat comprises a member selected from the group consisting of a cellulose ether, a cellulose ester and a cellulose ester-ether emulsifiers which subcoat is permeable to the passage of fluid and maintains its physical and chemical integrity in fluid;

(2) the overcoat comprising a member selected from the group consisting of hydroxypropylcellulose, hydroxypropylmethylcellulose, carboxymethylcellulose, and methylcellulose, and wherein said overcoat loses its physical and chemical integrity in fluid; which wall surrounds;

(b) a compartment;

(c) a therapeutically effective amount of drug in the compartment; and

(d) at least one passageway in the wall connecting the exterior with the interior of the device for delivering the drug over time.

5,024,843

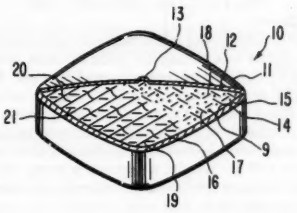
ORAL HYPOGLYCEMIC GLIPIZIDE GRANULATION

Anthony L. Kuczynski; Atul D. Ayer, and Patrick S.-L. Wong, all of Palo Alto, Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Filed Sep. 5, 1989, Ser. No. 402,314

Int. Cl.[5] A61K *9/16, 31/50, 47/38, 47/32*

U.S. Cl. 424—499 2 Claims



1. A pharmaceutical granulation comprising granules of 2 mg to 50 mg of substantially aqueous insoluble glipizide, from 100 mg to 320 mg of a polyethylene oxide having a 80,000 to 350,000 molecular weight, and from 5 mg to 50 mg of a hydroxypropylmethylcellulose having a 9,200 to 2,000 molecular weight, which granules are useful for manufacturing an osmotic dosage form for dispensing the glipizide for up to 22 hours when the dosage form is in gastrointestinal tract of a patient.

5,024,844

PROCESS FOR THE PRODUCTION OF DRIED EARTHWORM POWDER AND ANTIHYPERLIPEMIC, ANTIDIABETIC, ANTIHYPERTENSIVE AND ANTIHYPOTENSIVE PREPARATIONS CONTAINING DRIED EARTHWORM POWDER AS ACTIVE INGREDIENT

Yoichi Ishii, and Hisashi Mihara, both of Miyazaki, Japan, assignors to Eimei Company, Ltd., Miyazaki, Japan

Filed Aug. 5, 1988, Ser. No. 228,672

Claims priority, application Japan, Aug. 18, 1987, 62-204904; Aug. 18, 1987, 62-204905; Apr. 19, 1988, 63-094541; Apr. 19, 1988, 63-094542

Int. Cl.[5] A61K *35/56*

U.S. Cl. 424—520 4 Claims

1. A process for the production of dried earthworm powder which comprises the steps of

(a) cleaning a species of living earthworms by leaving the living earthworms in an aqueous solution containing not greater than 0.3% by weight of at least one compound selected from the group consisting of an organic acid, an

inorganic acid, a sodium salt of an organic acid, a sodium salt of an inorganic acid, a potassium salt of an organic acid, and a potassium salt of an inorganic acid, until the alimentary canal thereof is freed of soil, and then washing the living earthworms with water to remove any dirt from the body surfaces thereof, or by washing the living earthworms with water to remove any dirt from the body surface thereof, and then leaving the living earthworms in said aqueous solution until the alimentary canal thereof is freed of soil;

(b) wet-grinding the living earthworms;

(c) freezing the resulting suspension at a temperature of −60° to −10° C.; and

(d) freeze-drying and then vacuum-drying the suspension under a vacuum of 10 mmHg or below for 10 to 100 hours while raising the temperature stepwise in the range of −60° to 80° C., the resulting powder being finally vacuum-dried at a temperature of 70° to 80° C. under a vacuum of 0.01 to 0.5 mmHg for 5 to 10 hours.

5,024,845

METHOD OF REDUCING L-MALIC ACID IN JUICE MEDIUM

Roy J. Thornton, and Susan B. Rodriguez, both of Palmerston North, New Zealand, assignors to Massey University, Palmerston, New Zealand

Continuation-in-part of Ser. No. 928,432, Nov. 10, 1986, Pat. No. 4,830,968. This application Dec. 23, 1987, Ser. No. 337,587

Claims priority, application New Zealand, Nov. 13, 1985, 214177

Int. Cl.[5] **C12G** *1/00*; **A23L** *2/02*

U.S. Cl. 426—15 **9 Claims**

1. A method for reducing L-malic acid in a juice medium which comprises inoculating the juice medium with a mutant of strain (A) *Schizosaccharomyces malidevorans* #442 (CBS 5557) or (B) as deposited as (ATCC 46954), which mutant requires both glucose and L-malic acid for growth, and which is capable of completely utilizing L-malic acid when grown on a matrix comprising L-malic acid, glucose at concentrations greater than 10% by weight, a nitrogen source, vitamins and a pH indicator having gradual color change over the pH range of about 3 to about 6.5.

5,024,846

SEPARATION OF STEROLS FROM LIPIDS

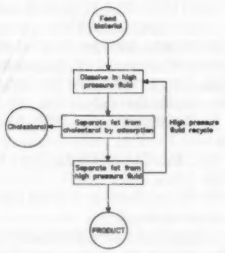
Corran N. S. McLachlan, 29 Summer Street, Devonport, Auckland; Owen J. Catchpole, and Bruce H. Hamilton, both of Wellington, all of New Zealand, assignors to Carran Norman Stuart McLachlan, Auckland, New Zealand

Continuation of Ser. No. 453,072, Dec. 18, 1989, abandoned, which is a continuation of Ser. No. 181,088, Apr. 14, 1988, abandoned. This application Aug. 2, 1990, Ser. No. 561,477

Claims priority, application New Zealand, Aug. 26, 1987, 221586

Int. Cl.[5] **C11B** *3/06, 3/10, 7/00*

U.S. Cl. 426—312 **7 Claims**



1. A method of separating sterols from lipids, including:

(a) dissolving a sterol/lipid mixture in a high pressure physiologically acceptable fluid selected from the group consisting of a high pressure liquid, a high pressure subcritical gas or a high pressure supercritical gas, to form a high pressure fluid mixture,

(b) contacting the high pressure fluid mixture with an adsorbant material comprising oxygen containing salts of the basic metals to selectively adsorb the sterols on the adsorbant material, and then

(c) removing the substantially sterol free lipids from the high pressure fluid.

5,024,847

SULFUR CONTAINING ACYCLIC TERPENES

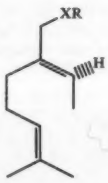
Philip A. Christenson, Midland Park, N.J.; Robert G. Eilerman, Merrick, N.Y.; Paul J. Riker, Lodi, and Brian J. Drake, Clifton, both of N.J., assignors to BASF K&F Corporation, Whippany, N.J.

Filed Sep. 18, 1989, Ser. No. 408,620

Int. Cl.[5] **A23L** *2/26*

U.S. Cl. 426—535 **8 Claims**

1. A compound represented by the formula



I

wherein

X is sulfur;

R is H, lower alkyl or an acyl group of 1 to 3 carbons; and

∼H indicates the presence of an E or Z configuration.

5,024,848

FREEZE DRIED SWEETENED CONDENSED MILK CRYSTALS AND PROCESS OF MAKING

Cindy E. Little, Orlando, Fla., assignor to Crystals International, Plant City, Fla.

Filed Mar. 9, 1990, Ser. No. 491,085

Int. Cl.[5] **A23C** *9/00, 9/16*

U.S. Cl. 426—587 **5 Claims**

1. A method of producing a food ingredient, said method comprising:

forming a solution consisting of 100% sweetened condensed milk made of whole milk and sucrose diluting said solution with water to form a solution having 50°–65° brix and

drying said solution under a pressure of 2.5 to 4.0 mm Hg by freeze-drying, effected by a continuous vacuum dryer to produce a dry food ingredient of 100% sweetened condensed milk crystals,

said drying being effected at a temperature in the range of from 165°–220° F. to avoid carmelization of the 100% sweetened condensed milk.

5,024,849

LIQUID COFFEE WHITENER

Casimir E. Rasilewicz, Woodland Hills, Calif., assignor to Nestec S.A., Vevey, Switzerland

Filed May 1, 1990, Ser. No. 517,130

Int. Cl.[5] **A23D** *7/00*

U.S. Cl. 426—656 **10 Claims**

1. A liquid coffee whitener which consists essentially of an aqueous fat emulsion system containing 3% to 18% by weight edible fat, 2.5% to 15% by weight carbohydrate, from 0.1% to 1% by weight of lipoidal emulsifier, and an amount of protein hydrolysate effective to stabilize the emulsion against fat sepa-

ration and buffer the emulsion, with the whitener having a pH above 7.0.

5,024,850

METHOD OF MANUFACTURING A POLARIZATION FILTER AND A POLARIZATION FILTER SO OBTAINED

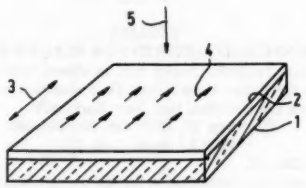
Dirk J. Broer, and Jan Van Der Veen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 6, 1989, Ser. No. 446,845

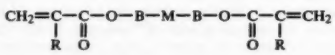
Claims priority, application Netherlands, May 10, 1989, 8901167

Int. Cl.[5] C09K *19/00*

U.S. Cl. 428—1 **5 Claims**



1. A method of manufacturing a polarization filter, in which a mixture of a liquid crystalline monomer and a dichroic colorant is oriented on a substrate, and the monomer is polymerized by exposing it to uniform radiation, characterized in that a monomer is used which corresponds to the formula



(I)

wherein

B is a bridging group,

R is a hydrogen atom or a methyl group, and

M is a mesogenic group comprising at least a phenyl group and/or a cyclohexyl group, so that the monomer as a whole acquires a nematic or smectic phase.

5,024,851

PROCESS FOR PREPARING A WOVEN MEDICAL FABRIC

Conrad D. Gond, Greensboro, N.C., and Jeffrey L. Taylor, Cincinnati, Ohio, assignors to Precision Fabrics Group Inc., Greensboro, N.C. and Standard Textile Co., Inc., Cincinnati, Ohio

Continuation of Ser. No. 259,201, Dec. 1, 1988, abandoned, which is a division of Ser. No. 164,197, Mar. 4, 1988, Pat. No. 4,822,667. This application Oct. 10, 1989, Ser. No. 418,973

Int. Cl.[5] A01N *1/02*

U.S. Cl. 427—2 **24 Claims**

1. A process of imparting water-resistent, flame-resistant, and low linting properties to a tightly woven medical fabric comprising the steps of:

(1) applying to a woven polyester fabric, constructed from polyester yarn of about 50 to about 150 denier with the sum of ends and picks of at least 100 per linear inch, an aqueous finish composition containing a fluorocarbon water repellent, and a flame retardant, and

(2) drying the fabric,

the resulting medical fabric having the following properties initially and following 100 laundering cycles:

	Initial	After 100 Cycles
linting (INDA 160-0-83) particles	at most 5,000	at most 5,000
flammability (NFPA 702)	Class II	Class II
[antimicrobial activity (CTM-0923)] [for Klebsiella pneumoniae]	[no growth]	[no growth]
Suter hydrostatic resistance (AATCC-127 centimeters/minutes	at least 45.0	at least 20.0
spraying rating (AATCC-22-1980)	at least 50.0	at least 20.0
air permeability (FTM 5450, Frazier method)	at most 5	at most 10

5,024,852

PROCESS FOR PREPARING A PROPHYLACTIC DEVICE MADE OF RUPTURABLE MICROCAPSULES AND LAYERS OF ELASTOMERIC MATERIAL

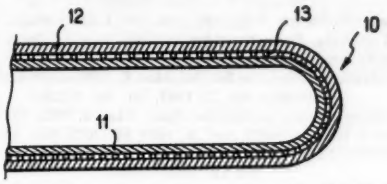
René-Guy Busnel, Bievres, and Gilles Argy, La Queue en Yvelines, both of France, assignors to Hutchinson, Paris, France

Division of Ser. No. 232,336, Aug. 15, 1988, Pat. No. 4,930,522. This application Mar. 28, 1990, Ser. No. 500,377

Claims priority, application France, Aug. 20, 1987, 87 11753

Int. Cl.[5] A61K *9/50*

U.S. Cl. 427—2 **12 Claims**



1. A process for the manufacture of a prophylactic device having contained therein at least one pharmaceutically active substance, comprising:

(a) forming a first layer of elastomeric material into the desired shape of the prophylactic device;

(b) prevulcanizing the first layer;

(c) applying to one side of the first layer a layer or microcapsules having at least one pharmaceutically active substance encapsulated therein;

(d) depositing on the coating of microcapsules a second layer of elastomeric material; and

(e) vulcanizing the first and second layers of elastomeric material.

5,024,853

METHOD TO CONTROL THE THICKNESS OF AN ANTIREFLECTION COATING AND IMPLEMENTATION INSTALLATION

Jean Landreau, Antony, and Hisao Nakajima, Paris, both of France, assignors to Etat Francais represente par le Ministre, Moulineaux, France

Filed Jun. 28, 1990, Ser. No. 544,876

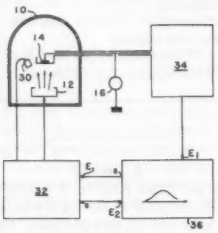
Claims priority, application France, Jul. 6, 1989, 89 09119

Int. Cl.[5] C23C *14/54*

U.S. Cl. 427—10 **7 Claims**

1. Method to control the thickness of an antireflection coating when deposited on one of the faces of a semiconductive laser, wherein the laser is fed with a constant current during depositing, this method being characterized in that the voltage is measured at the laser terminals, the passage of this voltage through a maximum being detected, which indicates that the antireflection coating has a thickness providing it with minimum reflectivity.

2. Installation for depositing an antireflection coating on one of the faces of a semiconductive laser and implementing the method according to claim 1, this installation including a depositing chamber equipped with an evaporation device and a laser support, a device to control the evaporation device and a



constant current source connected to a connection opening inside the chamber, wherein this installation further includes a device suitably adapted to detect the moment when the voltage at the terminals of the current source passes through a maximum.

5,024,854

METHOD OF MANUFACTURING PERPENDICULAR TYPE MAGNETIC RECORDING MEMBER

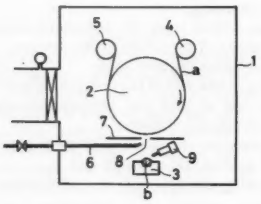
Kyuzo Nakamura; Yoshifumi Ota, and Taiki Yamada, all of Yachimata, Japan, assignors to Nihon Shinku Gijutsu Kabushiki Kaisha, Chigasaki, Japan

Continuation of Ser. No. 587,742, Mar. 8, 1984, abandoned. This application Sep. 22, 1989, Ser. No. 412,535

Claims priority, application Japan, Mar. 8, 1983, 58-36652; Mar. 8, 1983, 58-36653; Apr. 26, 1983, 58-72075; May 18, 1983, 58-85786; May 21, 1983, 58-38389

Int. Cl.[5] H01F *10/02*

U.S. Cl. 427—38 10 Claims



1. A method for manufacturing a perpendicular-type magnetic recording member, comprising the steps of:

providing a substrate for said magnetic recording member in an evacuated vacuum chamber;

introducing oxygen gas into the vacuum chamber while simultaneously vaporizing in the vacuum chamber at least one magnetic metal selected from the group consisting of Fe, Co and Ni, thereby causing partial oxidation of the vapors of said magnetic metal and deposition of the partially oxidized metal vapors on the substrate, wherein the temperature of the substrate is approximately equal to room temperature during said deposition;

controlling the proportion of said magnetic metal and controlling the oxygen pressure so as to obtain a perpendicular magnetic film having a composition represented by $(Fe_xCo_yNi_z)_{1-m}O_m$, wherein $O<x\leqq 0.05$, $O\leqq z\leqq 0.40$, $x+y+z=1$, and $0.15\leqq m\leqq 0.50$, whereby said obtained perpendicular magnetic film comprises magnetic particles of said magnetic metal and non-magnetic particles of oxide of said metal, and the obtained magnetic film has a magnetic anisotropy in the direction perpendicular to the plane of the film which satisfies the following conditions:

$Ku\perp > 2\pi Ms^2$,

$Hc\perp > Hc\parallel$, and

$Br\perp > Br\parallel$,

wherein $Ku\perp$ is the crystal magnetic anisotropy energy in the direction perpendicular to the film surface, Ms is the saturation magnetization, $Hc\perp$ is the coercive force in the direction perpendicular to the film surface, $Hc\parallel$ is the coercive force in the direction parallel to the film surface, $Br\perp$ is the residual magnetic flux density in the direction perpendicular to the film surface, and $Br\parallel$ is the residual magnetic flux density in the direction parallel to the film surface.

5,024,855

ORAL RINSE AND METHOD FOR PLAQUE REMOVAL

Sol Gershon, Teaneck; Charles Fox, Fairlawn, both of N.J., and Norton Garfinkle, Boca Raton, Fla., assignors to Cambridge Research Laboratories, Inc., New York, N.Y.

Filed Sep. 13, 1989, Ser. No. 406,460

Int. Cl.[5] A61K *7/16, 7/18*

U.S. Cl. 424—52 15 Claims

1. An oral rinse composition for removing plaque present on dental surfaces consisting essentially of:

(a) a plaque disrupting component consisting essentially of an alkali metal or ammonium orthophosphate or mixtures thereof in an amount of from 1.2 to 10% by weight and from 0.05 to 8% by weight of one or more surfactants selected from among water-soluble salts of higher fatty acid monoglyceride monosulfates, higher alkyl sulfates, alkyl aryl sulfonates, higher fatty acid esters of 1,2-dihydroxypropane sulfonate, sodium and potassium N-lauroyl sarcosine, ethanolamine salts of N-lauroyl, N-myristyl and N-palmitoyl sarcosine, polyethylene oxide condensates of alkyl phenols, surfactants derived from the condensation of ethylene oxide with the reaction product of propylene oxide and ethylenediamine and ethylene oxide condensates with aliphatic alcohols and mixtures of esters of sorbitor and sorbitol anhydrides consisting predominantly of the monoester condensed with ethyleneoxide;

(b) optionally one or more auxiliary materials selected from among humectants, sweetness, flavoring agents, detergent builders, therapeutic agents and thickening agents; and

(c) an aqueous/alcoholic carrier; wherein the pH of said composition if 5.5 to 10.5.

5,024,856

METHOD AND APPARATUS FOR APPLYING A FLUX

Ernst Hohnerlein, Ringstrasse 7, 6983 Kreuzwertheim, Fed. Rep. of Germany

Continuation of Ser. No. 265,233, Oct. 31, 1988, abandoned. This application Dec. 29, 1989, Ser. No. 456,575

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1988, 3809156

Int. Cl.[5] B05B *3/12*

U.S. Cl. 427—57 9 Claims

1. In a soldering method requiring applying a flux material to a small area point forming a joint to be soldered on an electrical component, the improvement comprising the following steps:

(a) transporting said electrical component in a given transport direction,

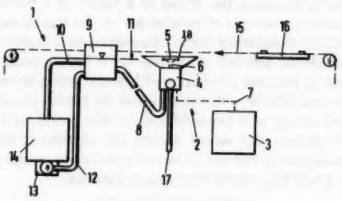
(b) ultrasonically atomizing said flux material in an ultrasonic atomizer (3, 5) in a substantially pressureless manner to provide a pressureless flux mist substantially without air turbulence,

(c) separately generating around said flux mist an airstream of hollow constant cross-section by an air nozzle (18) independently of said atomizing of said flux materials,

(d) moving said ultrasonic atomizer (3, 5) and said air nozzle (18) in a direction substantially perpendicular to said given transport direction, and

(e) entraining and carrying said pressureless flux mist inside said hollow constant cross-section airstream for supplying said pressureless flux mist to any small area point forming a joint to be soldered on said electrical component by directing said hollow constant cross-section airstream onto said small area point forming a joint to be soldered without substantial mixing between said flux mist and said airstream to avoid fouling said electrical component with flux even without masking.

3. An apparatus for applying flux to a small area point forming a joint to be soldered on an electrical component, comprising means (15) for transporting said electrical component in a given transport direction (19), ultrasonic atomizer means (3, 5) including an atomizing element (5) for producing a pressureless



flux mist in a substantially pressureless manner and substantially without air turbulence, means (8, 9, 10) for delivering flux material in a pressureless manner to said ultrasonic atomizer means, ring nozzle means (18) surrounding said atomizing element (5), said ring nozzle means (18) including a blower device for separately generating a hollow cross-section airstream of uniform diameter independtly of said atomizer means to surround said flux mist with said hollow cross-section airstream for entraining and carrying said pressureless flux mist from said atomizer means to said small area point, and means for moving said atomizer means and said ring nozzle means in a direction substantially perpendicularly to said given transport direction for locating said ring nozzle means (18) into a position for carrying said flux mist with said hollow cross-section airstream to any small area point forming a joint to be soldered, to avoid fouling said electrical component with flux even without masking.

5,024,857

METHOD FOR COATING THE ARMATURE OF A ROTARY ELECTRIC APPARATUS

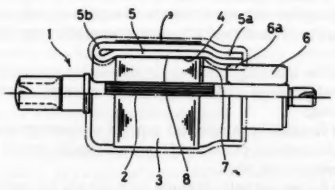
Ikuo Arakawa, Omama, Japan, assignor to Mitsuba Electric Manufacturing Co., Ltd., Gunma, Japan

Filed Feb. 14, 1990, Ser. No. 480,128

Claims priority, application Japan, Feb. 14, 1989, 1-34099

Int. Cl.[5] C23C *26/00*

U.S. Cl. 427—104 **3 Claims**



1. A method for coating coils and slots of an armature of a rotary electric apparatus comprising the steps of:

dropping a first coating material onto deep areas within the slots and narrow areas between the coils of the armature;

heating the first coating material to a gelled state to prevent said first coating material from dripping off of said armature;

dropping a second coating material onto the coils and slots of the armature after the first coating material is gelled; and

hardening said first and second coating materials on said armature.

5,024,858

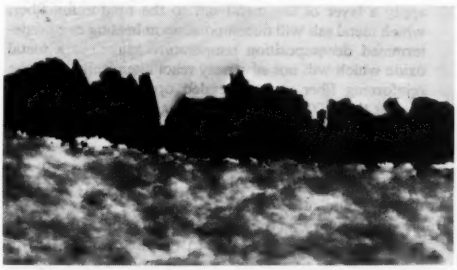
METALLIZED POLYMERS AND METHOD

Robert R. Burch, Exton, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 214,406, Jul. 7, 1988, abandoned. This application May 17, 1989, Ser. No. 351,962

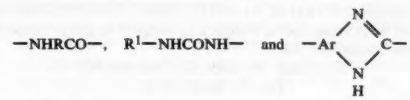
Int. Cl.[5] B05D *3/10*

U.S. Cl. 427—123 **19 Claims**



1. A method for metallizing polymer substrate with a metal, comprising the steps (i), (ii) and (iii) or (i), (ii), and (iv):

(i) treating a polymer having at least one repeating unit selected from the group:



wherein:

R is selected from R^3 and R^1NHCOR^2,

R^1 and R^3, individually, are selected from m-phenylene, p-phenylene, 3,3′-biphenylene, 3,4′-biphenylene, 4,4′-biphenylene and 4,4′-diphenylene ether,

R^2 is selected from R^1 and $—CH_2—_x$,

Ar is a trisubstituted aromatic radical in which two of the three aryl bonds are adjacent to one another and attached to nitrogen atoms, and

x is 1 to 10; with a nonaqueous solution of strong base selected from alkali metal hydroxides; $R^4R^5N^-$, wherein R^4 and R^5 are each selected from the group consisting of C_1–C_{12} alkyl, C_6H_5, $C_{10}H_7$, $C_{12}H_9$, $C(=O)R^6$ wherein R^6 is C_1–C_{12} alkyl; CH_2CN^-; R^7· wherein R^7 is C_1–C_{12} alkyl; H^-; R^8SOR^9 wherein R^8 and R^9 are each C_1–C_{12} alkyl; $R^{10}O^-$ wherein R^{10} is C_1–C_{12} alkyl; and the polyanions of the polymers, or a combination thereof, alone or in the presence of alcohols, amines or nitrates; to generate anionic sites on the polymer surface,

(ii) contacting the polymer with a metal cation to electrostatically bond the cation to the anionic sites, and

(iii) reducing the meal cation to metal at the anionic sites on the polymer surface and forming metallic sites, or

(iv) treating the metal cation with a compound that forms a semiconductor therewith and forming a semiconductor imbibed polymer.

5,024,859

METHOD FOR APPLYING AN OXIDE BARRIER COATING TO A REINFORCING FIBER

Michael L. Millard, Sharonville; Michael G. Harrison, West Chester, and Andrew Szweda, Middletown, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Nov. 20, 1989, Ser. No. 440,575

Int. Cl.[5] B05D *3/02*

U.S. Cl. 427—226 7 Claims

1. A method for applying an oxide barrier coating to a reinforcing fiber having a predetermined fiber diameter to provide the coating with a preselected coating microstructure and thickness, comprising the steps of:

(a) providing an aqueous solution including a concentration of a metal oxyhalide salt selected from the group consisting of zirconium oxyhalide, hafnium oxyhalide and mixtures thereof, the concentration of the metal salt in water being selected to provide the preselected coating microstructure;

(b) wetting the reinforcing fiber with the aqueous solution to apply a layer of the metal salt to the reinforcing fiber, which metal salt will decompose, upon heating in a predetermined decomposition temperature range, to a metal oxide which will not adversely react chemically with the reinforcing fiber at an intended operating temperature greater than 1000° C. in an oxidizing atmosphere wherein the thickness of the layer is selected to provide on the fiber, after heating in the decomposition temperature range, a coating of the metal oxide of a thickness in the range of about 0.05% to less than 7% of the fiber diameter; and subsequently;

(c) heating the layer in the decomposition temperature range to decompose the metal salt to the metal oxide and to provide on the reinforcing fiber the oxide barrier coating with the preselected coating microstructure and coating thickness.

5,024,860

ROCKET MOTOR INSULATION USING PHOSPHONITRILIC ELASTOMERIC COMPOSITIONS

Suae-Chen Chang, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed May 24, 1989, Ser. No. 356,183

Int. Cl.[5] B05D *7/22*

U.S. Cl. 427—230 10 Claims

1. A process for producing a low smoke, insulating liner for rocket motor casings comprising the steps of

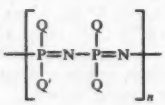
a. mixing a vulcanizable composition comprising

1) from about 1 to about 60% by weight of an organic polymer fiber selected from the group polyaramid, polybenzimidazole and mixtures thereof;

2) from about 1 to about 25 percent by weight of an inorganic powder filler having a specific surface area of from about 1 meter^2/gram to about 200 meter^2/gram;

3) from about 0 to about 75 percent by weight of a vulcanizable hydrocarbon elastomer and;

4) a non-fluorinated phosphazene polymer of the formula



where Q and Q′ are the same or different and are substituted or unsubstituted alkoxy or aryloxy and Q″ is a group having olefinic unsaturation;

b. applying said mixture to the inner surface of the rocket motor casing:

c. vulcanizing said mixture.

5,024,861

GASEOUS OR VAPOR PHASE TREATMENT OF WOOD WITH BORON PRESERVATIVES

Peter Vinden, Tarawera; Russell J. Burton, and Timote M. Vaioleti, both of Rotorua, all of New Zealand, assignors to Her Majesty the Queen In Right of New Zealand Acting by and Through the Minister of Forestry for New Zealand, Wellington, New Zealand

Filed Jun. 23, 1988, Ser. No. 210,638

Claims priority, application New Zealand, Jun. 23, 1987, 216746

Int. Cl.[5] C23C *16/28;* B05D *3/02, 3/04*

U.S. Cl. 427—254 19 Claims

18. A process for the preservative or remedial treatment of wood or wood based products with a boron based preservative, comprising the steps of placing the wood to be treated in a common treatment vessel, drying the wood to a reduced moisture content of below 10% by weight of the dried wood, subsequently exposing the wood to a vapor of a boron compound under conditions of evacuation of the treatment vessel and elevated temperature in the treatment vessel and for a time sufficient for an amount of boron or a boron preservative compound to become deposited within the wood to an extent sufficient and effective for said boron or boron preservative compound to act as a preservative for the wood, and subsequently exposing the wood within the treatment vessel to steam conditioning thereof to raise the moisture content of the wood to a working moisture content therefor.

5,024,862

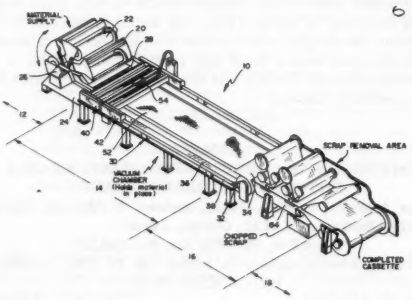
AUTOMATED CUTTING AND KITTING SYSTEM OF COMPOSITE MATERIAL AND METHOD

Ed Frank, Aston, Pa., assignor to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 252,488, Sep. 30, 1988, abandoned. This application Sep. 19, 1990, Ser. No. 587,604

Int. Cl.[5] B05D *1/02, 3/12;* B05B *3/18;* B05C *11/00*

U.S. Cl. 427—264 13 Claims



1. An automated cutting and kitting system for at least two types of preimpregnated composite material, comprising:

preimpregnated composite material supply means containing a supply of each type of preimpregnated composite material;

means for indexing said supply means for presenting a selected type of preimpregnated composite material for cutting;

means for cutting a selected type of preimpregnated composite material presented from said supply means to form a series of cut plies;

means for sequentially shaping each cut ply by cutting each said ply in accordance with a preselected outline; and

means for kitting each shaped ply by storing each shaped ply for subsequent use in a layup in accordance with its position in the layup.

12. A method of cutting and kitting a layup of a plurality of

plies of at least two types of preimpregnated composite material, comprising the steps of:

aligning each ply of a given type of preimpregnated composite material in the order in which it is to be positioned in the layup;

sequentially cutting each ply in accordance with a predetermined shape; and

kitting the cut plies by storing the cut plies such that the top ply of the layup is stored first.

5,024,863

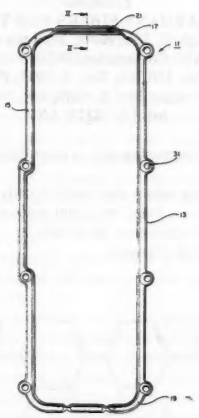
ENGINE GASKET WITH OIL IMPERMEABLE SURFACE

Robert M. Gibbon, Fort Worth, Tex., assignor to JMK International, Inc., Fort Worth, Tex.

Filed Feb. 2, 1990, Ser. No. 474,503

Int. Cl.[5] B05D *3/02*

U.S. Cl. 427—387 **4 Claims**



2. A method for manufacturing an engine gasket for a vehicle engine having reduced oil permeability, the method comprising the steps of:

first, forming the engine gasket in the desired shape from a silicone rubber compound comprising a polyorganosiloxane gum, a filler and a catalyst, the engine gasket having an inner surface exposed to hot engine oil and an outer surface;

next, applying a silicone varnish coating to at least the inner surface of the engine gasket after the gasket is formed, whereby the inner surface is substantially coated by the silicone varnish coating to provide a flexible surface coating, the silicone varnish coating comprising a silicone resin, a solvent and a catalyst; and

wherein the engine gasket is formed in a generally rectangular configuration having a pair of oppositely arranged long sides and a pair of oppositely arranged short sides, at least one of the short sides having an intermediate fleshy portion of silicone rubber which is of a greater cross-sectional thickness than the remaining portions of the engine gasket, the silicone varnish being applied to the inner surface of the fleshy portion to decrease the oil permeability of the inner surface.

5,024,864

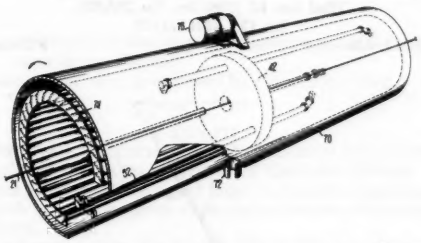
METHODS OF AND APPARATUS FOR MAKING AN INSULATED TRANSMISSION MEDIUM

Larry L. Bleich, Omaha, Nebr.; Joni A. Roberts, Stone Mountain, Ga., and Stephen T. Zerbs, Gretna, Nebr., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 160,891, Feb. 26, 1988, Pat. No. 4,877,645. This application Oct. 30, 1989, Ser. No. 429,265

Int. Cl.[5] B05D *1/02*

U.S. Cl. 427—424 **9 Claims**



1. A method of making an insulated elongated transmission medium, said method comprising the steps of:

moving an elongated transmission medium along a path of travel in a direction along the longitudinal axis of the elongated transmission medium; while

applying a molten, substantially non-porous plastic insulating material to the elongated transmission medium;

directing spray patterns of a coating material toward the elongated transmission medium wherein said spray patterns are directed toward the elongated transmission medium in such a manner that at least each of a plurality of the spray patterns occupies only an area of a plane and such that the direction of each of the plurality of spray patterns is at a predetermined angle to the path of travel, the plurality of spray patterns being staggered along and spaced generally equiangularly about the path of travel and cooperating to prevent unintended undulations of the elongated transmission medium as the elongated transmission medium is moved along the path of travel; then

exposing the plastic insulating material to a cooling medium; and

taking up the insulated elongated transmission medium.

5,024,865

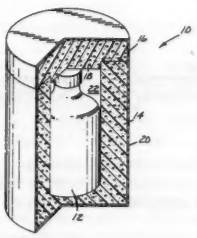
SORBENT, IMPACT RESISTANT CONTAINER

Thomas I. Insley, Lake Elmo, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 335,202, Apr. 7, 1989, abandoned. This application Oct. 2, 1990, Ser. No. 593,308

Int. Cl.[5] B32B *23/02*

U.S. Cl. 428—36.4 **27 Claims**



1. A container having structural rigidity, impact resistance, providing cushioning and absorbency properties comprising

compressed particles of polyolefin microfibers, said container having a solidity of at least 20% and less than about 80%.

5,024,866

COMPOSITE SKI POLE AND METHOD OF MAKING SAME

David P. Goode, Bloomfield Hills, Mich., assignor to SKI Accessories, Inc., Waterford, Mich.

Filed Jan. 12, 1989, Ser. No. 296,222
Int. Cl.[5] A63C 11/22
U.S. Cl. 428—36.4 6 Claims

1. A strong, lightweight, flexible, ski pole comprising:
a shaft;
a basket mounted adjacent a first lower end of said shaft;
a tip mounted on said first lower end of said shaft; and
a grip mounted on the opposite end of said shaft;
said shaft comprising filament-reinforced, resin-matrix composite body having an anti-splinter veil located on said shaft radially outward of said filaments; wherein, said anti-splinter veil comprises a polyester layer wrapped about said reinforcing filaments and embedded in said resin-matrix, and said filaments run essentially rectilinearly along said shaft.

5,024,867

DOPANT FILM AND METHODS OF DIFFUSING IMPURITY INTO AND MANUFACTURING A SEMICONDUCTOR WAFER

Masaburo Iwabuchi, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 27, 1988, Ser. No. 263,202
Claims priority, application Japan, Oct. 28, 1987, 62-272114; Jul. 14, 1988, 63-173718
Int. Cl.[5] C09J 7/02
U.S. Cl. 428—40 3 Claims

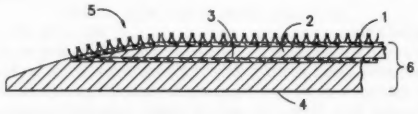
1. A dopant film structure comprising:
a dopant film containing an organic binder, an inorganic binder and a compound of an impurity element for diffusion;
adhesive layers coated both surfaces of said dopant film; and
releasable sheets sandwiching said dopant film with said adhesive layers interposed therebetween.

5,024,868

DUST CONTROL MAT AND METHOD OF MANUFACTURING SAME

Helle B. Petersen, Aarhus, Denmark, assignor to Milliken Denmark A/S, Morke, Denmark

Filed Oct. 19, 1989, Ser. No. 423,846
Int. Cl.[5] B32B 3/02, 33/00; D03D 27/00
U.S. Cl. 428—88 8 Claims



1. A dust control mat comprising a pile layer, a backing layer of rubber or plastic material and a flexible nonwoven reinforcing layer embedded in said backing layer, said nonwoven layer having fibers of nonwoven and spun bonded materials which are heat set and crosslinked, said nonwoven layer extending to a point adjacent said pile layer and having one edge thereof abutting the underside of said pile layer preventing the exposure thereof to an area surrounding said dust control mat.

5,024,869

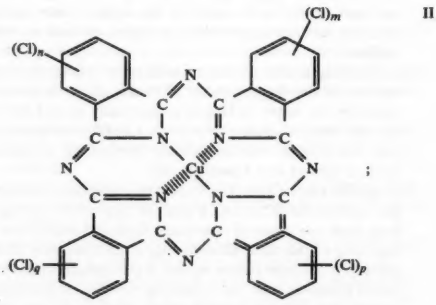
FLAME RETARDANT FIBERS FOR TEXTILE USE

Ling Yeh, and Hugh G. Harrelson, Jr., both of Anderson, S.C., assignors to BASF Corporation, Williamsburg, Va.

Division of Ser. No. 130,763, Dec. 9, 1987, Pat. No. 4,853,272.
This application Jun. 8, 1989, Ser. No. 363,024
Int. Cl.[5] B32B 3/02
U.S. Cl. 428—97 20 Claims

1. A method of preparing one or more flame retardant fibers comprising:
(a) incorporating into a thermoplastically processable synthetic polymer a flame retardant amount of a flame retardant material consisting essentially of
(i) carbon black pigment;
(ii)

(iii)



II

wherein: m, n, p, and q are each either 0 or an integer from 1 to about 4; or,

(iv) mixtures thereof; and,

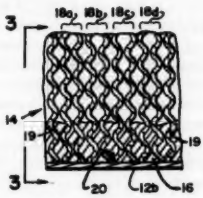
(b) melt processing said synthetic polymer and said fire retardant material of step (a) into said one or more fibers.

5,024,870

METHOD FOR POTTING PLEATED FILTER MEDIA AND FILTERS MADE THEREBY

William E. Jackson, Bloomington, Minn., assignor to Donaldson Company, Inc., Minneapolis, Minn.

Filed Feb. 19, 1987, Ser. No. 16,278
Int. Cl.[5] B32B *3/28;* B01D *27/00;* B65B *7/00*
U.S. Cl. 428—181 23 Claims



3. A filter element comprising:

(a) a pair of end caps;

(b) pleated, corrugated panel filter media having edges thereon constructed and arranged for positioning proximate said end caps;

(c) potting material within said end caps for sealing said edges of said filter media therein, wherein said filter media edges are configured in a sine wave shape to permit substantially uniform penetration of said potting material into a region between adjacent corrugated panels of said pleated filter media within each of said end caps.

5. A filter element comprising:

(a) a pair of end caps;

(b) pleated, corrugated panel filter media having edges thereon constructed and arranged for positioning proximate said end caps;

(c) potting material within said end caps for sealing said edges of said filter media therein, wherein said filter media edges are configured in a saw tooth shape to permit substantially uniform penetration of said potting material into a region between adjacent corrugated panels of said pleated filter media within each of said end caps.

7. A filter element comprising:

(a) a pair of end caps;

(b) pleated, corrugated panel filter media having edges thereon constructed and arranged for positioning proximate said end caps;

(c) potting material within said end caps for sealing said edges of said filter media therein, wherein said filter media edges are configured in a square wave shape to permit substantially uniform penetration of said potting material into a region between adjacent corrugated panels of said pleated filter media within each of said end caps.

5,024,871

CERAMIC FILLED FLUOROPOLYMETRIC COMPOSITE MATERIAL

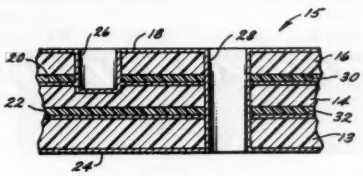
David J. Arthur, Norwood, and Gwo S. Swei, Northboro, both of Mass., assignors to Rogers Corporation, Rogers, Conn.

Filed Feb. 21, 1990, Ser. No. 483,501
Int. Cl.[5] B32B *9/00*
U.S. Cl. 428—209 28 Claims

1. An electrical substrate material comprising:

fluoropolymeric material;

silaceous ceramic filler material, said filler material being in



an amount of at least about 50 volume percent of the total substrate material; and

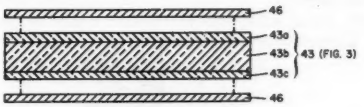
said ceramic filler being coated by a zirconate coating.

5,024,872

SHEETS OF STRETCHED AND POLARIZED POLYMER MATERIALS AND METHOD OF MANUFACTURER

David T. Wilson, Billerica, and Roger H. Tancrell, Cambridge, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 834,290, Feb. 27, 1986, abandoned.
This application Aug. 13, 1987, Ser. No. 86,176
Int. Cl.[5] B32B *7/02, 27/00*
U.S. Cl. 428—212 13 Claims



1. A sheet comprising:

a molecularly polarized polymer material having a multilayered structure comprising:

a pair of outer surface layers of said sheet each surface layer having a first modulus of elasticity, a first density, a first hydrostatic charge sensitivity and a first relative permittivity; and

an inner region of said sheet disposed between said pair of outer surface layers of the sheet having a second modulus of elasticity which is lower than the modulus of elasticity of each of said pair of outer surface layers, a second density which is lower than the density of said pair of outer surface layers, a second hydrostatic charge sensitivity which is higher than the hydrostatic charge sensitivity of said pair of outer surface layers, and a relative permittivity which is lower than the relative permittivity of said pair of outer surface layers.

3. The sheet as recited in claim 1 wherein said polymer material comprises polyvinyldene fluoride.

5,024,873

COMPOSITE FILMS WITH LANGMUIR-BLODGETT COMPONENT

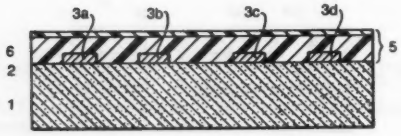
John J. Burack, Elizabeth; Jane D. LeGrange, and Wesley P. Townsend, both of Princeton, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 5, 1988, Ser. No. 280,074
Int. Cl.[5] B32B *27/00*
U.S. Cl. 428—220 8 Claims

1. The combination comprising:

a substrate body, a plurality of electroconductive elements disposed in spaced relation of the surface of said body, and a composite film adhering to said body and coating said electroconductive elements and surface areas therebetween of said body, said composite film comprising:

a first film of dielectric material other than a Langmuir-Blodgett film and a second Langmuir-Blodgett film prepared from amphiphilic material and thinner than



said first film, said two films being in superposed relation with each other, and said Langmuir-Blodgett film rendering said composite film more moisture resistant than either of said first and second films taken alone.

5,024,874

THREE DIMENSIONAL FABRIC WITH A LINKAGE STRUCTURE

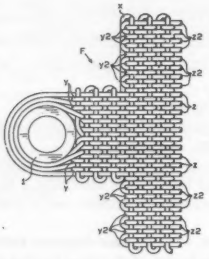
Yoshiharu Yasui; Meiji Anahara; Goro Asahi, all of Kariya, and Shiro Miyake, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya and Japan Defense Agency, Tokyo, both of Japan

Filed Feb. 13, 1990, Ser. No. 479,352

Claims priority, application Japan, Feb. 16, 1989, 1-36649; Feb. 16, 1989, 1-36650

Int. Cl.[5] B32B *7/00*

U.S. Cl. 428—257 **15 Claims**



1. A three dimensional fabric comprising:

a multiplicity of strings arranged and woven to form a multiplicity of warps arranged in a plurality of rows and columns, a plurality of first wefts crossing the warp columns in the interstitial spaces between adjacent warp rows, and a plurality of second wefts crossing said warps and said first wefts in the interstitial spaces between adjacent warp columns; and

a solid member that is incorporated into the body of the three dimensional fabric by a plurality of said strings that are wound about the outer periphery of the solid member.

5,024,875

ANTIMICROBIAL MICROPOROUS COATING

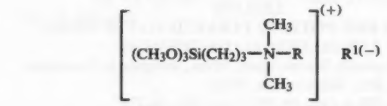
Berlie R. Hill, Cana, Va.; Thomas F. Watson, Sr., Greensboro, and Benny L. Triplett, Pleasant Garden, both of N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed Sep. 9, 1986, Ser. No. 905,135

Int. Cl.[5] B05D *3/10*; B32B *5/18, 5/20*

U.S. Cl. 428—267 **6 Claims**

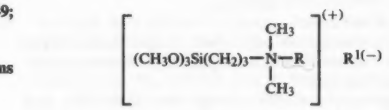
1. A process of making a waterproof, water-vapor-permeable, antimicrobial coated fabric having a durable, antimicrobial, microporous polyurethane layer thereon formed by the wet coagulation method, said process comprising applying a water-miscible, polar organic solvent solution of a polyurethane elastomer to a base fabric, immersing the thus-coated base fabric into an aqueous coagulation bath to extract the solvent from the polymer solution leaving a porous polyurethane matrix adhered to the base fabric, then washing and drying the coated fabric, wherein the polyurethane elastomer solution contains a bioactive amount of a bioactive silyl quaternary ammonium compound of the formula:



wherein R is an alkyl of 11 to 22 carbon atoms and R^1 is bromine or chlorine, the resulting coated fabric having a moisture vapor transmission of at least 800 $g/m^2/24$ hours and a hydrostatic pressure resistance of at least 10 psi.

5. A process of preparing a polyurethane-based coating solution for application to a fabric substrate to form a rainproof, water-vapor-permeable coated fabric with durable antimicrobial properties, a moisture-vapor transmission of at least 800 $g/m^2/24$ hours, and a hydrostatic pressure resistance of at least 10 psi, said process comprising the sequential steps of:

(a) mixing together a methanol solution of a bioactive silyl quaternary ammonium compound of the formula:



wherein R is an alkyl of 11 to 22 carbon atoms and R^1 is bromine or chlorine, with N,N-dimethylformamide and a surfactant to form a first solution;

(b) preparing a solution of at least one polyurethane resin in a water-miscible, compatible liquid vehicle; and

(c) combining the solutions of steps (a) and (b) to form a water-coagulable, polyurethane-based, bioactive coating composition for application to fabric substrates via the wet coagulation method to make microporous, rainproof, water vapor-permeable antimicrobial coated fabrics resistant to the spread of mildew.

5,024,876

REINFORCED PLASTIC COMPRISING POLY(ARYLENE SULFIDE SULFONE) POLYMER CONTAINING ETHER GROUPS MATRIX

Rex L. Bobsein, Bartlesville, Okla.; Mark L. Stone, Idaho Falls, Id., and Jon F. Geibel, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 28, 1990, Ser. No. 486,563

Int. Cl.[5] B32B *7/00, 27/00, 9/00*; C08G *8/02*

U.S. Cl. 428—272 **15 Claims**

1. A reinforced plastic comprising:

(a) reinforcing material consisting essentially of continuous long fibers in

(b) an ether group-containing poly(arylene sulfide sulfone) polymer matrix.

5,024,877
FIRE RESISTANT MATERIALS

Francis P. McCullough, Jr., Lake Jackson; R. Vernon Snelgrove, Damon, both of Tex., and David M. Hall, Auburn, Ala., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 337,912, Apr. 14, 1989, abandoned, which is a continuation-in-part of Ser. No. 114,324, Oct. 28, 1987, Pat. No. 4,879,168, which is a continuation-in-part of Ser. No. 206,634, Jun. 14, 1988, which is a continuation-in-part of Ser. No. 108,255, Oct. 13, 1987, Pat. No. 4,898,783. This application Feb. 14, 1990, Ser. No. 479,828

Int. Cl.[5] D04H *1/16*

U.S. Cl. 428—282 **36 Claims**

1. An improved ignition resistant structure comprising the combination of a non-graphitic carbonaceous material having an LOI value of greater than 40, a char formation greater than about 65% and a thermal conductivity of the material in fiber form less than 1 BTU ft/Hr ft^2 °F. with about 0.5 to 90% by weight of an organosilicone polymer comprising the following recurring units: $(Si—O—Si—O)_n$ in an amount to provide ignition resistance to said structure.

5,024,878
COMPOSITE MATERIAL WITH ZIRCONIA MATRIX

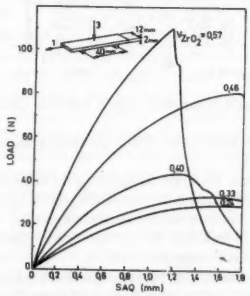
Christian Robinbrosse, Le Haillan; Roger Naslain, Pessac; Jacky Minet, and Francis Langlais, both of Gradignan, all of France, assignors to Societe Europeenne de Propulsion, Suresnes, France

Filed Aug. 28, 1989, Ser. No. 409,510

Claims priority, application France, Sep. 14, 1988, 88 12000

Int. Cl.[5] G32G *5/06*

U.S. Cl. 428—297 **4 Claims**



1. Composite material with zirconia matrix comprising a fibrous reinforcement and a matrix deposited by chemical vapor infiltration through the porosity of the reinforcement, wherein the reinforcement is constituted by a fibrous fabric in fibers selected from carbon fibers and silicon carbide fibers, the matrix containing free carbon co-deposited with the zirconia.

5,024,879
PROCESS FOR CONSOLIDATING DISCONTINUOUS-STRUCTURED MATERIALS

Vincenzo Massa, Busto Arsizio; Aldo Cicuta, and Walter Cavigiolo, both of Novara, all of Italy, assignors to Ausimont S.p.A., Milan, Italy

Continuation of Ser. No. 134,846, Dec. 14, 1987, abandoned. This application Dec. 26, 1989, Ser. No. 453,173

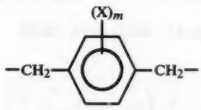
Claims priority, application Italy, Dec. 17, 1986, 22718 A/86

Int. Cl.[5] C23C *16/04;* **B32B** *3/26*

U.S. Cl. 428—304.4 **6 Claims**

1. A process for consolidating, that is, adhering a solid material or article which exhibits at least one area of low cohesion exhibiting a mechanical strength value lower than 700 kg/cm^2 with respect to stretching or lower than 100 kg/cm^2 with respect to compression, the said solid material or article being associated with at least one structural discontinuity having a section dimension ranging from 0.01 micron to 100 microns, pervious from the outside and communicating with the outside through a port equal in size to or less than the size of the section dimension of the structural discontinuity, which process comprises:

(a) introducing into said low-cohesion area associated with a structural discontinuity vapors of at least one para-xylylene monomer or monomeric derivative thereof corresponding to formula I:



(I)

wherein X represents a C_1–C_6 alkyl group, a C_6–C_{10} aryl group, a C_7–C_{16} aralkyl group, a halogen-alkyl or halogen-aralkyl group, an acetoxy, alkenyl, aminoalkyl, arylamino, cyano, alkoxy, hydroxy, nitro group, a halogen atom, a sulphonic radical or a sulphonic ester, or a phosphorus-based substituent, a sulphonic, sulphuric, or alkyl-sulphoxide group, or a hydrogen atom, and m is an integer ranging from 0 to 4, including operating under vacuum at a pressure ranging from approximately 0.01 to 1 mm Hg; so the penetration depths of the vapors inside of the structural discontinuity are from one millimeter to one centimeter, and

(b) polymerizing said monomer vapors in situ inside said area of low-cohesion associated with said structural discontinuity to adhere to said structural discontinuity, thereby restoring said solid material or article substantially to its original condition.

5,024,880
CELLULAR PRESSURE-SENSITIVE ADHESIVE MEMBRANE

George F. Veasley, Hudson, Wis.; Jurgen Klingen, Schwalmtal, Fed. Rep. of Germany, and Donald T. Landin, Eagan, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 3, 1990, Ser. No. 460,621

Int. Cl.[5] B32B *3/26, 7/12, 15/04*

U.S. Cl. 428—317.5 **19 Claims**

1. A phase-separated cellular pressure-sensitive adhesive membrane surrounding and thereby defining a multiplicity of small voids, constituting from 15% to 85% of the volume of said membrane, said membrane possessing improved internal strength and a high degree of compression recovery, said membrane consisting essentially of

(a) from about 70 parts to about 98 parts of an acrylic polymer of monomers containing:

(i) at least about 75 parts of an alkyl acrylate monomer, the alkyl groups of which contain from 1 to 14 carbon atoms, having an average of 4 to 12 carbon atoms,

(ii) from 0 to about 25 parts of a monoethylenically unsaturated polar copolymerizable monomer,

(iii) from about 0.01 part to about 1 part of a photoinitiator, and

(iv) from about 0.1 part to about 5 parts of a surfactant,

(b) correspondingly, from about 30 parts to about 2 parts of a hydrocarbon elastomer or blend of hydrocarbon elastomers containing only saturated segments, containing at least one segment having a lower T_g than the acrylic copolymer,

wherein the adhesive has at least a first phase and a second phase, the first phase consisting primarily of the elastomer, phase consisting primarily of the acrylic, at least one phase being a continuous phase.

5,024,881

MATERIAL FOR USE IN COMPOSITE SLIDING SURFACE BEARINGS AND PROCESS OF MANUFACTURING THE MATERIAL

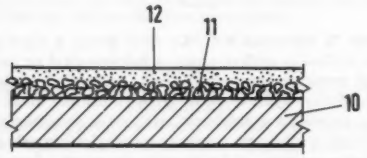
Karl-Heinz Matucha, Kelkheim; Thomas Steffens, Offenbach; Hans-Paul Baureis, Dielheim-Horrenberg; Wolfgang Bickle, Reilingen, and Jürgen Braus, Walldorf, all of Fed. Rep. of Germany, assignors to Kolbenschmidt Aktiengesellschaft, Neckarsulm, Fed. Rep. of Germany

Filed May 2, 1989, Ser. No. 346,058

Claims priority, application Fed. Rep. of Germany, May 5, 1988, 3815265

Int. Cl.[5] B32B *5/16, 15/08*

U.S. Cl. 428—323 **9 Claims**



1. A material for use in composite sliding surface bearings having a plastic sliding layer, which material comprises a metallic backing layer and a sliding layer, which is bonded to the backing layer and has a thickness of 30 to 500 μm, and consists of a matrix-forming fluorine-containing polymer that contains a fine dispersion of 5 to 50% by weight, metal powder having a high affinity to fluorine and a particle size of ≦40 μm, wherein the fluorine-containing polymer contains 0.5 to 5.0% by weight metal fluoride and 0.5 to 5.0% by weight metal oxyfluoride and consists of 10 to 25% by weight monoclinally crystallized PVDF, 10 to 40% by weight amorphous PVDF and 10 to 30% by weight of novel polymer which, in an X-ray diffractogram prepared by CuKα radiation, has a sharp intensity peak at a double Bragg angle of $2\theta = 18.07° \pm 0.03°$ and has a melting range of 320° to 350° C. and is free of orthorhombically crystallized PVDF.

2. A material according to claim 1, wherein the metal powder consists of lead, tin, zinc, indium, thallium, cadmium, bismuth, barium, copper, silver or an alloy thereof, individually or in combination, and is dispersed in the fluorine-containing polymer.

5,024,882

MATERIAL FOR USE IN COMPOSITE SLIDING SURFACE BEARINGS AND PROCESS OF MANUFACTURING THE MATERIAL

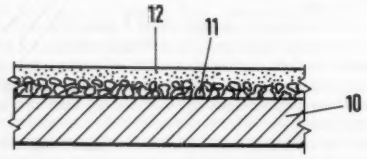
Karl-Heinz Matucha, Kelkheim; Thomas Steffens, Offenbach; Hans-Paul Baureis, Dielheim-Horrenberg; Wolfgang Bickle, Reilingen, and Jürgen Braus, Walldorf, all of Fed. Rep. of Germany, assignors to Kolbenschmidt Aktiengesellschaft, Neckarsulm, Fed. Rep. of Germany

Filed May 2, 1989, Ser. No. 346,059

Claims priority, application Fed. Rep. of Germany, May 5, 1988, 3815264

Int. Cl.[5] B32B *5/16, 15/08*

U.S. Cl. 428—323 **11 Claims**



1. A material for use in composite sliding surface bearings having a plastic sliding layer, which material comprises a metallic backing layer and a sliding layer, which is bonded to the backing layer and has a thickness of 30 to 500 μm and consists of a matrix-forming fluorine-containing polymer that contains a fine dispersion of 5 to 50% by weight metal powder having a high affinity to fluorine and a particle size of ≦40 μm, wherein the fluorine-containing polymer has , in an X-ray diffractogram prepared by CuK α-radiation, a shaft intensity peak at a double Bragg angle of $2\theta = 18.07° \pm 0.03°$ and has a melting range of 320° to 350° C. and contains 5 to 30% by weight metal fluoride and 0.5 to 5.0% by weight metal oxyfluoride.

2. A material according to claim 1, wherein the metal powder consists of lead, tin, zinc, indium, thallium, cadmium, bismuth, barium, copper, silver or an alloy thereof, individually or in combination, and is dispersed in the fluorine-containing polymer.

5,024,883

ELECTRONIC PACKAGING OF COMPONENTS INCORPORATING A CERAMIC-GLASS-METAL COMPOSITE

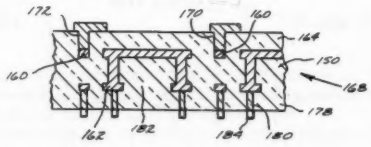
Narendra N. SinghDeo, New Haven; Deepak Mahulikar, Meriden, both of Conn., and Sheldon H. Butt, Godfrey, Ill., assignors to Olin Corporation, New Haven, Conn.

Division of Ser. No. 924,970, Oct. 30, 1986, Pat. No. 4,882,212.

This application Sep. 14, 1989, Ser. No. 407,511

Int. Cl.[5] B32B *9/00*

U.S. Cl. 428—323 **22 Claims**



1. A composite combined with a metallic component, comprising:

a base component formed of a ceramic-glass-metal composite material;

said composite material comprising an effective amount up to about 25 volume % of metallic particles for enhancing the flow characteristics of said composite;

from about 15 to about 50 volume % of a glass for adhering said composite together; and

the balance essentially ceramic particles wherein said glass reacts chemically with both said metallic particles and said ceramic particles and said metallic particles have a melting temperature greater than the melting temperature of said glass;

said composite having a structure comprising substantially a matrix of said glass with said ceramic and metallic particles dispersed therein; and

a metallic component, said component being embedded into said composite material.

5,024,884

ABRADABLE SEAL HAVING PARTICULATE EROSION RESISTANCE

William F. Otfinoski, Meriden, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 686,176, Dec. 24, 1984, abandoned.

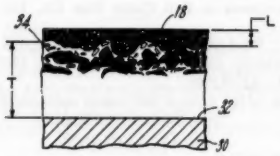
This application Jan. 23, 1987, Ser. No. 9,623

Int. Cl.[5] B32B *5/16, 15/04;* **B05D** *1/06, 1/10*

U.S. Cl. 428—328 **14 Claims**

1. An abradable seal structure of the multiple knife edge type comprises of a porous powder metal plasma arc sprayed deposit having 26–40 percent density on a metal substrate, wherein the deposit is characterized by having interlocked to its surface a layer material comprised of equiaxed particulates

in a ceramic matrix, wherein the hardness of the particulates is no greater than the hardness of the metal of said sprayed deposit; the particulates are substantially smaller than the surface pores of said sprayed deposit, and some of said particulates are



contained within said surface pores; sand said layer material improves the resistance of said sprayed deposit to erosion when the seal is rubbed by said knife edges.

2. The seal of claim 1 characterized by the layer having a thickness of at least 0.025 mm.

5,024,885

MAGNETIC RECORDING MEDIUM

Yasushi Endo; Mikihiko Kato; Toshio Kawamata, and Kouichi Masaki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 30, 1988, Ser. No. 252,076
Claims priority, application Japan, Sep. 30, 1987, 62-244141
Int. Cl.[5] G11B *23/00*
U.S. Cl. 428—329 **7 Claims**

1. A magnetic recording medium comprising a non-magnetic support having thereon a magnetic layer containing ferromagnetic particles which are hexagonal system tabular particles and which have an axis of easy magnetization in a direction perpendicular to the major axis of the plate and are dispersed in a binder, wherein said ferromagnetic particles have saturation magnetization of 60 emu/g or higher, a specific surface area (BET method) of from 25 to 70 m^2/g. an average particle diameter of from 0.01 to 0.2 μm, and a coercive force of from 400 to 2000 oersteds, and said binder contains a resin having at least one kind of polar group in an amount of 1×10^{-5} eq/g or more of the polar group, wherein said magnetic recording medium is a floppy disk in which thermocycle running durability is improved.

5,024,886

SEALING SHEETS FOR ROOFS

Pierre Geisen, Strasbourg, and Jean-Claude Reillaudoux, Souffelweyersheim, both of France, assignors to Soprema S.A., Strasbourg, France

Filed Sep. 22, 1988, Ser. No. 247,540
Claims priority, application France, Dec. 24, 1987, 87 18467
Int. Cl.[5] B32B *11/04, 7/12;* **B05D** *1/36*
U.S. Cl. 428—332 **13 Claims**

1. A composite sealing sheet for roofs comprising two layers, the first layer comprising a non-adhesive asphalt-base sheet, with a film of a polymer having a high tear resistance applied directly to its upper surface; and

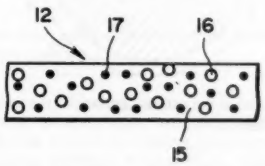
the second sealing layer comprising an asphalt-base sealing sheet having a self-adhesive under-surface which si applied directly to said first sealing iayer.

5,024,887

THERMO-SENSITIVE TRANSFER INK RIBBON TO BE USED FOR PRODUCING DRY TYPE TRANSFER MATERIAL

Mitsuo Yamane, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Jan. 23, 1989, Ser. No. 299,232
Claims priority, application Japan, Jan. 21, 1988, 63-11631
Int. Cl.[5] B41M *5/26*
U.S. Cl. 428—335 **29 Claims**



1. A thermo-sensitive transfer ink ribbon to be used for producing a dry type transfer material comprising:

a ribbon substrate material;

an ink layer formed on one of opposite surfaces of said substrate material, said ink layer comprising a mixture of fine particles of a coloring agent, a binder and a pressure-sensitive adhesive; and

a transfer property control layer formed on said ink layer and containing a thermo-sensitive adhesive and a tackiness agent.

5,024,888

MODIFIED POLYBUTYLENE-BASE HOT MELT COMPOSITIONS

Charles C. Hwo, Sugar Land, and Simone Mostert, Cypress, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 306,430, Feb. 3, 1989, Pat. No. 4,977,206, which is a continuation-in-part of Ser. No. 91,484, Aug. 31, 1987, abandoned. This application Jul. 30, 1990, Ser. No. 560,647
Int. Cl.[5] C09J *151/00;* **B32B** *7/12, 15/04*
U.S. Cl. 428—355 **15 Claims**

1. A laminar structure comprising a substrate which is bonded with a hot melt adhesive capable of peelability, and wherein said hot melt adhesive comprises:

from about 50 percent by weight to about 95 percent by weight of a modified ethylenic copolymer selected from the group: maleated ethylene methyl acrylate copolymer, and maleated ethylene acrylic acid copolymer;

from about 50 percent by weight to about 5 percent by weight of a butene-1 homopolymer or copolymer; and

up to about 1 phr of a stabilizer.

5,024,889

SURFACE TREATMENT FOR SILICON CARBIDE FILAMENTS AND PRODUCT

Raymond C. Loszewski, Windham, N.H., assignor to Avco Corporation, Providence, R.I.

Filed Mar. 16, 1989, Ser. No. 324,180
Int. Cl.[5] B32B *9/00, 18/00;* **D02G** *3/00*
U.S. Cl. 428—368 **7 Claims**

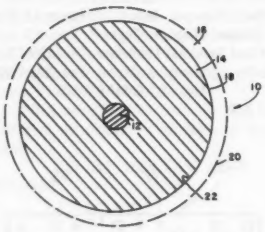
1. A high strength silicon carbide monofilament comprising:

a core;

a stoichiometric bulk layer of SiC deposited on the core;

a carbon-rich SiC layer deposited on the bulk layer forming an interface with the SiC bulk layer, said carbon-rich SiC layer having a ratio of silicon to carbon which decreases almost linearly from a maximum value of 1 (stoichiomet-

ric) at the interface of SiC bulk layer and the carbon-rich SiC layer to a minimum value of about 0.43 (70% carbon,



30% silicon) at the exterior surface of the carbon-rich SiC surface layer.

5,024,890

SIZE COMPOSITION FOR IMPREGNATING FILAMENT STRANDS AND GLASS FIBERS COATED THEREIN

Jean C. Pollet, Granville; Gary L. Williams; Gordon P. Armstrong, both of Newark, and Martin C. Flautt, Granville, all of Ohio, assignors to Owens-Corning Fiberglass Corporation, Toledo, Ohio

Continuation of Ser. No. 24,954, Mar. 12, 1987, abandoned. This application Nov. 22, 1988, Ser. No. 275,158

Int. Cl.[5] B32B *9/00*; **D02G** *3/00*

U.S. Cl. 428—372 **13 Claims**

1. A glass fiber having a coating thereon, consisting essentially of a coupling agent, a film former material and a thermoplastic polymer resin powder wherein the coating is the dried residue formed by evaporation of water from an aqueous composition comprising, in weight percent, based on the weight of the aqueous composition, about 0.05 to about 5.0 wt. % coupling agent, about 0.5 to about 5.0 wt. % film former material and about 30 to about 50 wt. % thermoplastic polymer resin powder.

5,024,891

POLYAMIDE RESIN-METAL LAMINATE

Norio Yoshiga; Masahiro Kawamura, and Hiroshi Nonoyama, all of Nagahama, Japan, assignors to Mitsubishi Plastics Industries limited, Tokyo, Japan

Filed Sep. 19, 1989, Ser. No. 409,317

Claims priority, application Japan, Mar. 22, 1988, 63-67909

Int. Cl.[5] B32B *27/38*

U.S. Cl. 428—414 **7 Claims**

1. A polyamide resin-metal laminate comprising a metal substrate having a heat-treated epoxy resin coating layer on its surface and a polyamide resin laminated on the coating layer of the substrate, said coating layer having been heat treated at a temperature of at least 350° C. for at least 3 seconds prior to lamination with said polyamide resin and having the following surface analytical spectrum values as measured by electron spectroscopy for chemical analysis (ESCA method):

(1) Relative elemental content of carbon element (C_{1s} spectrum): at least 50 atomic %,

(2) Relative contents based on the total content of C═O, C—O, C═C—C═C, CH and C—C functional groups of the C_{1s} spectrum, as determined by the respective waveform analyses: C═O group: at least 4.0 atomic %, and C—O group: at most 25 atomic %.

5,024,892

MAGNETIC RECORDING MEDIUM HAVING A BINDER COMPRISING A COPOLYMER WHICH INCLUDES A VINYL COMPOUND HAVING A DIALKYLAMINOALKYL GROUP

Hidcomi Watanabe, and Tsutomu Okita, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 9, 1988, Ser. No. 192,036

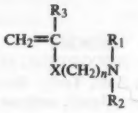
Claims priority, application Japan, May 8, 1987, 62-112084; May 8, 1987, 62-112086

The portion of the term of this patent subsequent to Nov. 14, 2006, has been disclaimed.

Int. Cl.[5] G11B *23/00*

U.S. Cl. 428—423.1 **15 Claims**

1. A magnetic recording medium comprising a non-magnetic support having provided thereon a magnetic layer containing ferromagnetic particles dispersed in a binder, wherein said binder comprises a copolymer comprising at least one vinyl compound having a dialkylaminoalkyl group and at least one copolymerizable vinyl monomer capable of being copolymerized with said vinyl compound, wherein said at least one vinyl compound containing a dialkylaminoalkyl group is selected from the compounds represented by formula (I):



(I)

wherein n represents an integer of from 1 to 4;

R_1 and R_2 each represents a hydrogen atom or an alkyl group having from 1 to 6 carbon atoms;

X represents —CONH—, —NHCONH—, or —$NHCO_2$—; and

R_3 represents a hydrogen atom or a methyl group.

5,024,893

HEAT-SENSITIVE RECORDING MEDIUM

Kazuyuki Hanada, Washinomiya; Kohichi Kuroda, Tokyo; Iwao Misaizu, Ageo; Masashi Kashimura, Tokyo; Tomoko Goto, Kawaguchi, and Katsumi Kuriyama, Koshigaya, all of Japan, assignors to Dainichiseika Color & Chemicals Mfg. Co., Ltd. and Ukima Colour & Chemicals Mfg. Co. Ltd., both of Tokyo, Japan

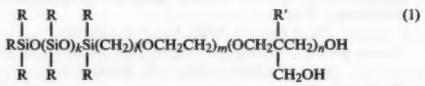
Division of Ser. No. 280,583, Dec. 6, 1988, Pat. No. 4,942,212. This application May 2, 1990, Ser. No. 517,619

Claims priority, application Japan, Jan. 20, 1988, 63-8234

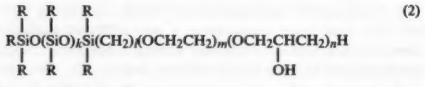
Int. Cl.[5] B41M *5/26*

U.S. Cl. 428—423.1 **7 Claims**

1. A thermal recording material, comprising a base sheet, a thermal recording layer provided on one side of the base sheet and a heat-resistant layer applied on the other side of the base sheet, wherein the heat-resistant layer comprises a polyurethane resin which contains, as pendant groups, residual groups of a siloxane compound having the formula (I) or (II) or both:



(1)



(2)

wherein R is an alkyl group, R′ is a hydrogen atom or C_1–C_5 alkyl group, k, l and m are **1–250**, **0–5** and **0–50**, respectively,

and n is an integer of 1–3 in the formula (I) and an integer of 2–3 in the formula (II), said siloxane polyol component being present in an amount sufficient to provide said polyurethane resin with tack-free and anti-blocking properties, while retaining resin flexibility.

5,024,894

METHOD OF PRODUCING SILICON AND SIMILAR WAFERS BUFFERED FOR THE DEPOSITION OF METAL OXIDE SUPERCONDUCTING (MOS) POLYMER COMPOSITES AND THE LIKE BY INSULATING METAL OXIDES (IMO) SUITABLE AS SUBSTRATES FOR MOS, AND NOVEL BUFFERED WAFERS PROVIDED THEREBY

James C. W. Chien, Amherst, Mass., assignor to Academy of Applied Science, Concord, N.H., a part interest

Continuation-in-part of Ser. No. 266,014, Nov. 2, 1988. This application Sep. 15, 1989, Ser. No. 407,912

Int. Cl.[5] B32B *9/00*

U.S. Cl. 428—433 **9 Claims**

1. A semiconductor wafer suitable for MOS deposition upon a surface thereof comprising a thin insulating metal oxide buffer layer adhered to said surface and compatible with MOS materials deposited thereon.

5,024,895

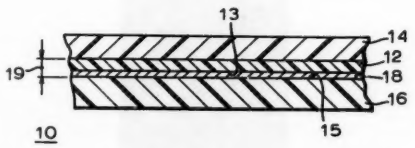
LAMINATE FOR A SAFETY GLAZING

Dean L. Kavanagh, and Robert H. M. Simon, both of Longmeadow, Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Jun. 18, 1990, Ser. No. 539,252

Int. Cl.[5] B32B *17/10*

U.S. Cl. 428—437 **7 Claims**



1. A flexible, draw-formed laminate capable of conforming to a surface with compound curvature for use in a safety glazing comprising a transparent, thermoplastic carrier film which is shrink-stable during laminating formation of said safety glazing, bonded to at least one layer of plasticized polyvinyl butyral, said film having a greater tensile modulus than that of the layer of plasticized polyvinyl butyral.

5,024,896

COLLIMATED METAL DEPOSITION

Gangadhara S. Mathad, Poughkeepsie; David Stanasolovich, Ithaca, both of N.Y., and Giorgio G. Via, McLean, Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 6, 1989, Ser. No. 350,182

Int. Cl.[5] B32B *27/08*

U.S. Cl. 428—473.5 **19 Claims**

1. A dual overhang, lift-off structure depositing metal comprising:

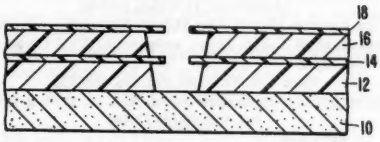
a substrate;

a first lift-off layer deposited on said substrate;

a first barrier layer deposited on said first lift-off layer, said first barrier layer having etch properties different from said first lift-off layer;

a second lift-off layer deposited on said first barrier layer, said second lift-off layer having etch properties similar to said first lift-off layer; and

a second barrier layer deposited on said second lift-off layer, said second barrier layer having etch properties similar to said first barrier layer, whereby undesired metal footing is



prevented from being deposited on the substrate by the two barrier layers.

5,024,897

BLENDS OF POLYAMIDE, POLYOLEFIN, AND ETHYLENE VINYL ALCOHOL COPOLYMER

Charles D. Mason, Chatham; William Sacks, Gillette, both of N.J.; Theodore R. Engelmann, and Satyajit Verma, both of Baton Rouge, La., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Division of Ser. No. 309,009, Feb. 7, 1989. This application May 2, 1990, Ser. No. 518,058

Int. Cl.[5] C08L *77/00, 29/02;* **B32B** *27/34, 27/28*

U.S. Cl. 428—474.4 **8 Claims**

1. A method to form a bottle from a composition comprising:

from 50 to 99.4 percent by weight of a polyolefin;

from 0.5 to 50 percent by weight of a polyamide; and

from 0.1 to 10 percent by weight of an ethylene vinyl alcohol copolymer comprising from 77.4 to 95 mole percent ethylene groups and from 5 to 22.6 mole percent vinyl alcohol groups and less than 2.0 mole percent unhydrolyzed vinyl acetate groups comprising forming the composition into a bottle having discontinuous regions of said polyamide in a matrix of said polyolefin, said polyamide regions being in the form of platelets and being from 5 to 500 micrometers in their longest dimension and having a thickness of from 1 to 50 micrometers.

5,024,898

ERASABLY MARKABLE ARTICLES AND METHODS OF MAKING SUCH ARTICLES

Warren R. Pitts, Needham; Hayden F. Estrada, W. Boylston, and Peter West, Wellesley, all of Mass., assignors to Dennison Manufacturing Company, Framingham, Mass.

Continuation-in-part of Ser. No. 360,962, Jun. 2, 1989. This application Feb. 6, 1990, Ser. No. 474,990

Int. Cl.[5] B32B *27/10;* **B05D** *3/02, 3/06*

U.S. Cl. 428—511 **18 Claims**

1. An erasably markable luminescent article comprising a substrate having at least two surfaces, wherein at least one surface of the substrate is markable with dry wipe inks, said surface after marking being substantially fully erasable, and said markable surface being provided by a smooth coating of cured lacquer, and said luminescent appearance resulting from a phosphorescent material which is embedded within the cured lacquer.

5,024,899

RESILIENT METALLIC FRICTION FACING MATERIAL

Richard D. Lang, 412 Wallace Ave., Crawfordsville, Ind. 47933

Filed Oct. 22, 1990, Ser. No. 601,289

Int. Cl.[5] B22F *3/10*

U.S. Cl. 428—550 **6 Claims**

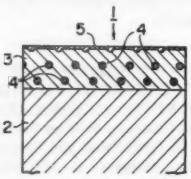
1. An improved metallic friction facing material comprising a porous, resilient fused metallic matrix, said matrix comprising partially fused first metal particles and a second metal having a lower boiling point than the first metal, said second metal being infused into and alloyed with said metal particles.

5,024,900

COMPOSITE NICKEL-PHOSPHORUS ALLOY PLATED METAL SHEET EXCELLENT IN STRIPPABILITY AND HAVING HIGH HARDNESS AND METHOD FOR MANUFACTURING SAME

Kiyoshi Kuruma; Masaki Abe; Hiroshi Kagechika, and Shinichi Kagaya, all of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

Filed Oct. 17, 1990, Ser. No. 599,152
Claims priority, application Japan, Apr. 26, 1990, 2-111478
Int. Cl.[5] B32B *15/08*
U.S. Cl. 428—626 7 Claims



1. A composite nickel-phosphorus alloy plated metal sheet excellent in strippability and having a Vickers hardness of at least 500 Hv, which comprises:

a composite nickel-phosphorus alloy mating plating layer formed on at least one surface of a metal sheet, in which Ni_3P particles and fluorocarbon polymer particles are uniformly dispersed, the sum of a phosphorus content in the matrix of said composite nickel-phosphorus alloy plating layer and a phosphorus content in said Ni_3P particles being within a range of from 1 to 15 wt. % relative to said composite nickel-phosphorus alloy plating layer and a content of said fluorocarbon polymer particles in said composite nickel-phosphorus alloy plating layer being within a range of from 0.3 to 15.2 wt. % relative to said composite nickel-phosphorus alloy plating layer; and

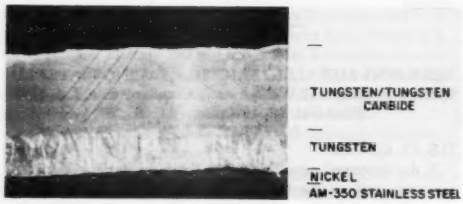
a fluorocarbon polymer layer formed on said composite nickel-phosphorus alloy plating layer by melting said fluorocarbon polymer particles which are exposed on the surface of said composite nickel-phosphorus alloy plating layer.

5,024,901

METHOD FOR DEPOSITING HIGHLY EROSIVE AND ABRASIVE WEAR RESISTANT COMPOSITE COATING SYSTEM ON A SUBSTRATE

Diwakar Garg, Macungie; Paul N. Dyer, Allentown; Leslie E. Schaffer, Macungie; Ernest L. Wrecsics, Bethlehem, all of Pa.; Duane Dimos, Upper Mount Clair, N.J., and Carl F. Mueller, Easton, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Division of Ser. No. 153,738, Feb. 8, 1988, Pat. No. 4,855,188.
This application May 3, 1989, Ser. No. 346,774
The portion of the term of this patent subsequent to Apr. 9, 2008, has been disclaimed.
Int. Cl.[5] B32B *15/04;* C23C *16/32, 16/14, 16/46*
U.S. Cl. 428—627 4 Claims



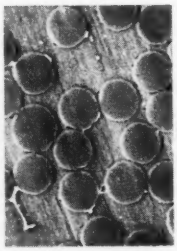
1. A method for producing a highly erosion and abrasion wear resistant composite coating system on a substrate selected from the group consisting of ferrous metals and alloys, non-ferrous metals and alloys, graphite, carbides and ceramics, comprising, chemical vapor depositing on the substrate a substantially columnar, intermediate layer of tungsten of sufficient thickness to confer substantial wear resistant characteristics on said coating system using a gaseous mixture of tungsten halide and hydrogen at pressures within the range of about 1 Torr. to about 1,000 Torr and a temperature of about 300° to about 650° C., and chemical vapor depositing on said intermediate layer a non-columnar, substantially lamellar outer layer of a mixture of tungsten and tungsten carbide using a gaseous mixture of tungsten halide, hydrogen and an oxygen-containing hydrocarbon at pressures within the range of 1 Torr to about 1,000 Torr and temperatures within the range of about 300° to about 650° C., with said tungsten carbide comprising W_2C, W_3C or a mixture of both, wherein the ratio of the thickness of the tungsten intermediate layer to the thickness of the outer layer is at least 0.35 in the case of tungsten plus W_2C in the outer layer, 0.60 in the case of tungsten plus W_3C in the outer layer and, 0.35 in the case of mixtures of tungsten and W_2C and W_3C in the outer layer.

5,024,902

FIBER-REINFORCED METAL

Katsuaki Suganuma, Yokosuka; Hiroyuki Fujii, Uji; Hiroyoshi Minakuchi, Kyoto; Katsuhiko Kada, Souraku; Haruo Osafune, Kameoka, and Kuniaki Kanamaru, Kyoto, all of Japan, assignors to Shimadzu Corporation, Kyoto, Japan

Filed Jun. 15, 1990, Ser. No. 538,436
Claims priority, application Japan, Jun. 27, 1989, 1-165554
Int. Cl.[5] C03C *13/00*
U.S. Cl. 428—633 5 Claims



1. A fiber-reinforced metal comprising glass fibers and a matrix metal surrounding and wetting said glass fibers, said glass fibers having a nitrogen content of at least 8 atomic %.

5,024,903

MAGNETIC RECORDING MEDIUM HAVING A MAGNETIC LAYER OF A QUATERNARY ALLOY

Makoto Mizukami, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Japan

Filed Apr. 3, 1989, Ser. No. 331,790
Claims priority, application Japan, Apr. 4, 1988, 63-82778
Int. Cl.[5] G11B *23/00*
U.S. Cl. 428—694 3 Claims

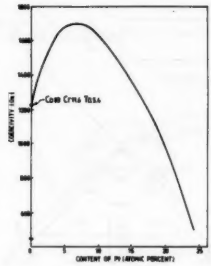
1. A magnetic recording medium suitable for high density recording, which comprises a non-magnetic substrate, a layer of Cr formed on the substrate and a layer of a CoCrTaPt quaternary alloy, said alloy consisting essentially of the following composition by atomic percent

$1 \leqq Cr \leqq 18$

$2 \leqq Ta \leqq 9$

$73 \leqq Co \leqq 97$

$1 \leqq Pt \leqq 10$



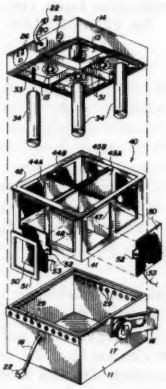
provided that the atomic percent of Cr, Ta and Co is 100 in total and the atomic percent of Pt is based on the total of Cr, Ta and Co.

5,024,904

DIRECT CURRENT SALT WATER ACTIVATED GENERATOR

Ray Curiel, Scottsdale, Ariz., assignor to Envirolite Products, Inc., Vancouver, Canada

Filed Nov. 1, 1990, Ser. No. 607,514
Int. Cl.[5] H01M *12/04*
U.S. Cl. 429—27 **34 Claims**



1. A portable direct current electric generator including in combination:

a lower outer housing member having enclosed sides, with an open top;

an inner housing member located within said lower outer housing member, said inner housing member having a bottom and closed sides and an open top, with at least a portion of a side of said inner housing member spaced from a side of said lower housing member to provide an air space adjacent said portion, and an aperture in said portion of said side of said inner housing member;

an air cathode member secured in said aperture in said portion of said side of said inner housing member, said air cathode member constructed to be impervious to water and permeable to air on the side thereof in contact with said air space, said inner housing member capable of holding water solutions with said air cathode member secured in said place in said aperture;

means for supplying air to said air space between said portion of said side of said inner housing member and said lower housing member;

cover means for removably covering the tops of said lower outer housing member and said inner housing member;

removable means extending into the interior of said inner housing member; and

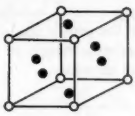
means for interconnecting an electrical load between said air cathode member and said anode means.

5,024,905

PLATINUM ALLOY ELECTROCATALYST

Takashi Itoh, Ichikawa, and Katsuaki Katoh, Matsudo, both of Japan, assignors to N. E. Chemcat Corporation, Tokyo, Japan

Filed Mar. 9, 1990, Ser. No. 491,421
Claims priority, application Japan, Mar. 9, 1989, 1-55109
Int. Cl.[5] H01M *4/92;* **B01J** *23/40*
U.S. Cl. 429—44 **22 Claims**



● Pt
○ Fe/Co/Cu

1. A platinuim alloy electrocatalyst comprising an electrically conductive carrier and dispersed in, and deposited on it, a platinum-iron-cobalt-copper quaternary ordered alloy composed of 40 to 70 atomic % of platinum, 9 to 27 atomic % of iron, 9 to 27 atomic % of cobalt and 9 to 27 atomic % of copper.

5,024,906

RECHARGEABLE ELECTROCHEMICAL CELL

Morris Eisenberg, Redwood City, Calif., assignor to Electrochimica Corporation, Menlo Park, Calif.

Filed Sep. 21, 1990, Ser. No. 586,295
Int. Cl.[5] H01M *10/40*
U.S. Cl. 429—101 **6 Claims**

1. A non-aqueous, rechargeable electrochemical cell comprising:

an active metal anode;

a reducible metal halide cathode with a positive electrode current collector; and

an electrolyte comprising a Lewis Acid salt of said active metal, an ionizing solvent comprising sulfur dioxide, and a co-solvent selected from the group consisting of methyl chloroformate (MCF), ethyl chloroformate (ECF) and sulfolane (SL).

5,024,907

SOLID ELECTROLYTE TUBE FOR SODIUM SULFUR CELLS AND SURFACE FINISHING PROCESS THEREOF

Masaaki Ohshima; Akira Kobayashi, both of Chofu; Senji Atsumi, Kakamigahara, and Hiromi Shimada, Nagoya, all of Japan, assignors to The Tokyo Electric Co., Tokyo and NGK Insulators, Ltd., Aichi, both of Japan

Filed Dec. 19, 1989, Ser. No. 452,430
Claims priority, application Japan, Dec. 19, 1988, 63-321336
Int. Cl.[5] H01M *10/38*
U.S. Cl. 429—191 **7 Claims**

1. A surface finishing process for a solid electrolyte tube, comprising the steps of:

(a) compression molding a green body in the shape of said tube;

(b) bisque firing and calcining said green body to form an intermediate body in the shape of said tube;

(c) firing said intermediate body to form a fired body; and mechanically finishing an outer surface of the body after any of steps (a) or (b) to such an extent that an outer surface of said fired body has a roughness value X;

wherein said roughness value X is defined by an arithmetical means deviation of the profile (R_a) of not greater than 2.0 microns and a maximum height of the profile (R_{max}) of not greater than 15 microns.

5,024,908

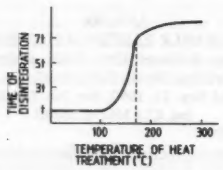
LEAD STORAGE BATTERY

Masayuki Terada, Hyogo; Shinji Saito, Mie, and Asahiko Miura, Nara, all of Japan, assignors to Shin-Kobe Electric Machinery Co., Ltd., Tokyo, Japan

Filed Mar. 6, 1990, Ser. No. 488,900

Int. Cl.[5] H01M *4/68, 4/82*

U.S. Cl. 429—245 **4 Claims**



2. A lead storage battery comprising an anodic plate obtained by forming an integral plate piece of a Pb/Ca base alloy sheeting with a Pb/Sn base alloy sheeting, and dipping the thus formed piece in sulfuric acid.

5,024,909

DRY FILM PROCESS FOR ALTERING WAVELENGTH RESPONSE OF HOLOGRAMS

William K. Smothers, Hockessin; Krishna C. Doraiswamy, and Mark L. Armstrong, both of Wilmington, all of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 380,933, Jul. 14, 1989, Pat. No. 4,959,283, which is a continuation-in-part of Ser. No. 144,840, Jan. 15, 1988, abandoned. This application Jun. 12, 1990, Ser. No. 536,792

The portion of the term of this patent subsequent to Sep. 25, 2007, has been disclaimed.

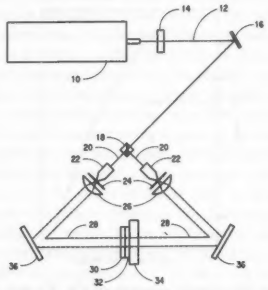
Int. Cl.[5] G03H *1/04, 1/06*

U.S. Cl. 430—1 **31 Claims**

1. A process for forming a volume phase hologram in a substantially solid, transparent, photosensitive film element comprising, in sequence:

(a) holographically exposing said film element to coherent light to record a volume hologram within said element;

(b) flooding said film element with actinic radiation to fix the volume hologram; and



(c) contacting said film element with a diffusion element for a time sufficient to modify the wavelength of light response by the hologram.

5,024,910

OPTICAL INFORMATION RECORDING MEDIUM

Takeo Ohta, Nara; Masami Uchida, Osaka; Koichi Kotera, Kawanishi, and Kunihiro Matsubara, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

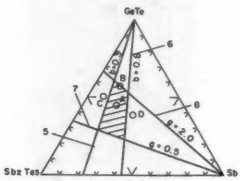
PCT No. PCT/JP88/00937, § 371 Date Jun. 21, 1989, § 102(e) Date Jun. 21, 1989, PCT Pub. No. WO89/04043, PCT Pub. Date May 5, 1989

PCT Filed Sep. 16, 1988, Ser. No. 378,521

Claims priority, application Japan, Oct. 28, 1987, 62-272502

Int. Cl.[5] G03C *1/00*

U.S. Cl. 430—19 **6 Claims**



1. An erasable optical information recording medium characterized in that a recording thin film made of three components of a GeTe alloy, an Sb_2Te_3 alloy and excess Sb is selected such that 10 mole % < excess Sb < 30% mole %, is formed on a substrate, said recording thin film having the capability of being heated, melted by irradiation of a laser beam and being converted into amorphization by quenching and having the capability of crystallization by heating the thin film in the amorphous state by irradiation of a laser beam.

5,024,911

ELECTROPHOTOGRAPHIC PHOTORECEPTOR HAVING AN ELECTRIC CHARGE GENERATING LAYER COMPRISING A PYRYLIUM COMPOUND

Yutaka Akasaki; Hidekazu Aonuma; Katsumi Nukada; Akihiko Tokita; Hidemi Suto; Katsuhiro Sato, and Hiroyuki Tanaka, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jun. 2, 1988, Ser. No. 201,203

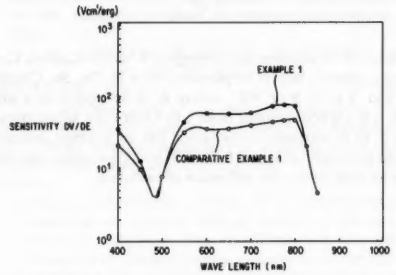
Claims priority, application Japan, Jun. 3, 1987, 62-138289

Int. Cl.[5] G03G *15/02, 15/09, 15/00, 15/06*

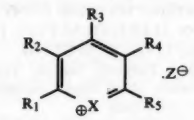
U.S. Cl. 430—58 **14 Claims**

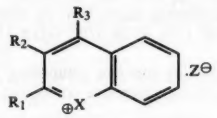
1. An electrophotographic photoreceptor comprising an electrically conductive substrate having thereon a light-sensi-

tive layer, said light-sensitive layer comprising an electric charge generating layer and an electric charge transporting layer, wherein the electric charge generating layer contains an



electric charge generating organic pigment having positive hole transporting properties and a pyrylium compound represented by the formula (I) or (II):


(I)


(II)

wherein X is an oxygen atom or a sulfur atom; R_1 and R_5 are each hydrogen, an alkyl group, a cycloalkyl group, an alkoxycarbonyl group, a benzyl group, a substituted or unsubstituted styryl group, or a substituted or unsubstituted phenyl group, and $Z\ominus$ is an anion, wherein an adhesive layer is provided between the light-sensitive layer and the electrically conductive substrate, wherein said electric charge generating layer is formed from a dispersion of said pigment and said pyrylium compound in a binder resin, wherein said electric charge generating organic pigment is present in an amount of from 0.25 to 10 parts by weight per part by weight of said binder resin, and wherein said pyrylium compound is present in an amount of from 0.001 to 0.5 part by weight per part by weight of said pigment.

5,024,912

5H-DIBENZO(A,D) CYCLOHEPTANYLIDENE DERIVATIVE AND 5H-DIBENZO (A,D) CYCLOHEPTENYLIDENE DERIVATIVE, AND ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER USING THE SAME

Toshie Neishi, Kawasaki; Toshihiro Kikuchi, Yokohama; Takao Takiguchi, Tokyo; Koichi Suzuki, Kawasaki, and Masakazu Matsumoto, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

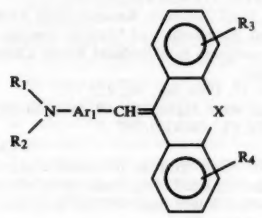
Continuation of Ser. No. 93,251, Sep. 4, 1987, abandoned. This application May 10, 1989, Ser. No. 351,304

Claims priority, application Japan, Sep. 10, 1986, 61-213320; Aug. 25, 1987, 62-212152

Int. Cl.[5] G03G *5/06, 5/09;* **C07C** *211/31*

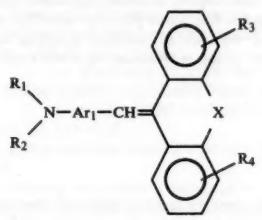
U.S. Cl. 430—59 **13 Claims**

1. An electrophotographic photosensitive member, which comprises photosensitive layer containing a compound represented by the following general formula [I]:


[I]

wherein X is $—CH_2CH_2—$ or $—CH=CH—$; R_1 and R_2 are alkyl groups, aralkyl groups, aromatic groups or heterocyclic groups; R_3 and R_4 are hydrogen atoms, alkyl groups, alkoxy groups or halogen atoms; and Ar_1 is an aromatic group or a heterocyclic group.

9. A 5H-dibenzo[a,d]cycloheptanylidene derivative and a 5H-dibenzo[a,d]cycloheptenylidene derivative represented by the following general formula [I]:


[I]

wherein X is $—CH_2—CH_2—$ or $—CH=CH—$; R_1 and R_2 are alkyl groups, aralkyl groups, aromatic groups or heterocyclic groups; R_3 and R_4 are hydrogen atoms, alkyl groups, alkoxy groups or halogen atoms; and Ar_1 is an aromatic group or a heterocyclic group.

5,024,913

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MATERIAL

Takeshi Yoshida, Kawachinagano; Kaname Nakatani, Osaka; Toshiyuki Fukami, Sakai, and Nariaki Tanaka, Kishiwada, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

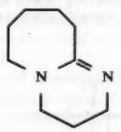
Filed Nov. 27, 1989, Ser. No. 441,263

Claims priority, application Japan, Nov. 30, 1988, 63-302657; Nov. 30, 1988, 63-302659

Int. Cl.[5] G03G *15/04, 5/00*

U.S. Cl. 430—67 **15 Claims**

1. An electrophotographic photosensitive material comprising a photosensitive layer and a surface protective layer containing a thermoset silicone resin, said photosensitive layer and said surface protective layer being laminated in this order on a conductive substrate surface, wherein the silicone resin of the surface protective layer is hardened by a hardening catalyst mainly comprised of a compound of the general formula (I)


(I)

or an acid salt thereof which is selected from the group consisting of: a phenol salt, an octylic acid salt, a ptoluenesulfonic acid salt and a formic acid salt.

5,024,914

RESIN FOR TONER PARTICLE

Ryo Funato, Nagoya; Syuji Takahiro, Kasugai; Keiji Yoshida, Nagoya; Shinji Kubo, Toyohashi, and Motoshi Inagaki, Nagoya, all of Japan, assignors to Mitsubishi Rayon Company Limited, Tokyo, Japan

Filed Oct. 17, 1989, Ser. No. 422,772

Claims priority, application Japan, Oct. 18, 1988, 63-290224

Int. Cl.[5] G03G *9/087*

U.S. Cl. 430—109 6 Claims

1. A toner resin for electrographic processes comprising particulate polymers having a softening temperature of higher than 120° C. and in which lower than 10% by weight of the polymer particles is less than 74 μ.

5,024,915

POSITIVELY CHARGEABLE DEVELOPER

Yukou Sato, Yokohama, and Tsutomu Kukimoto, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 16, 1989, Ser. No. 437,207

Claims priority, application Japan, Nov. 17, 1988, 63-290475

Int. Cl.[5] G03G *9/00, 9/083, 9/107*

U.S. Cl. 430—110 36 Claims

1. A developer for developing electrostatic latent images, comprising a toner and a fine silica powder; said fine silica powder being treated with an aminosilane coupling agent having a tertiary amino group represented by the formula:

wherein R_5 and R_6 represent the same or different substituents, provided that the total of the carbon atom number of R_5 and R_6 is not less than 8,

and having an oxidation potential of nOt more than 800 mV.

5,024,916

ORGANOMETAL-CONTAINING POLYMERS AND USE THEREOF IN A PHOTOSENSITIVE COMPOSITION WITH PHOTOACID GENERATORS

Alfred Steinmann, Praroman, Switzerland, assignor to CIBA-GEIGY Corporation, Ardsley, N.Y.

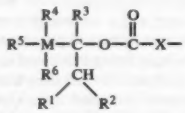
Division of Ser. No. 237,472, Aug. 29, 1988, Pat. No. 4,965,316. This application Sep. 24, 1990, Ser. No. 587,293

Claims priority, application Switzerland, Sep. 7, 1987, 3426/87

Int. Cl.[5] G03C *1/76*

U.S. Cl. 430—270 12 Claims

1. A composition comprising (a) a polymer having groupings of the formula I



(I)

in which R^1 to R^6 independently of one another are C_1–C_4alkyl, C_1–C_4alkoxy, phenyl, benzyl, phenoxy, a group $—M(R^8)_3$ or

or R^3 and R^4 together are

and R^1 to R^3 in addition are hydrogen, R^8 is C_1–C_4alkyl, C_1–C_4alkoxy, phenyl, benzyl or phenoxy, M is Si, Ge, Sn, CH_2Si or OSi and X is O, S or NR′, where R′ is hydrogen or a single bond, b is a whole number from 1 to 6 and c is a whole number from 3 to 6, wherein the polymer has an average molecular weight between 1,000 and 1,000,000 and (b) a compound liberating an acid under the influence of radiation.

5,024,917

OPTICAL RECORDING MEDIUM CONTAINING META-POSITION ALUMINIUM-TYPE IR-RAY ABSORPTIVE COMPOUND

Chieko Mihara, Kawaski; Tsuyoshi Santoh, Yokohama, and Hiroyuki Sugata, Yamato, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

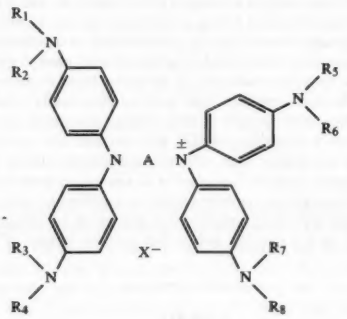
Filed Nov. 22, 1989, Ser. No. 440,073

Claims priority, application Japan, Nov. 28, 1988, 63-298373

Int. Cl.[5] G03C *1/00;* B32B *3/02;* G11B *11/03*

U.S. Cl. 430—271 6 Claims

1. An optical recording medium comprising a recording layer containing an IR-ray absorptive compound represented by formula (I):



(I)

wherein A is

R_1 to R_8 are hydrogen, halogen, or a univalent organic radical, or at least one of the combinations of the atomic groups of R_1 and R_2, R_3 and R_4, R_5 and R_6, and R_7 and R_8 forms together with the nitrogen a substituted or unsubstituted five-, six- or seven-membered heterocycle; R_1 to R_8 being the same or different, and the combinations of R_1 and R_2, R_3 and R_4, R_5 and R_6, and R_7 and R_8 being the same or different; and X^- is an anion.

5,024,918

HEAT ACTIVATED DRY DEVELOPMENT OF PHOTORESIST BY MEANS OF ACTIVE OXYGEN ATMOSPHERE

Vernon R. Porter, Plano, and Thomas C. Penn, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 23, 1976, Ser. No. 754,041
Int. Cl.[5] G03C 5/24
U.S. Cl. 430—269 **30 Claims**

1. In the fabrication of an electronic structure, wherein a layer of photoresist material is disposed on a substrate surface of different material, a method of forming a dry developed pattern in said layer of photoresist material, said method comprising:

selecting a photoresist material of a character subject to a chemical or physical change rendering the photoresist material resistant to heat volatilization in response to the exposure of the photoresist material to an energy source,

depositing a layer of said photoresist material on a substrate surface of different material,

selectively exposing said layer of photoresist material to an energy source for providing exposed and unexposed regions on the photoresist material defining a latent image,

subjecting the layer of photoresist material to a heat treatment,

partially volatizing the unexposed regions of the photoresist material to provide regions of reduced thickness relative to the exposed regions of the photoresist material in response to the heat treatment,

exposing said layer of photoresist material to a reactive gaseous atmosphere wherein the reactive character of the gaseous atmosphere is derived essentially from a gaseous reactive oxygen species of the group consisting of monatomic oxygen, ozone and mixtures thereof under conditions adapted for differentially reacting said gaseous reactive oxygen species with the exposed and unexposed regions of said layer of photoresist material,

selectively removing photoresist material from said layer thereof at respectively different rates of removal with the unexposed regions of reduced thickness of said layer of photoresist material having the greater rate of removal from said layer by the differential reaction of the gaseous reactive oxygen species therewith, and discontinuing the selective removal of photoresist material from said layer thereof when only the regions of reduced thickness of said layer of photoresist material have been completely removed down to the substrate surface by ceasing exposure of said layer of photoresist material to the gaseous reactive oxygen species, thereby dry developing the latent image defined in the photoresist material to produce a pattern in said layer of photoresist material.

5,024,919

PROCESS FOR FORMING FINE PATTERN IN SEMICONDUCTOR DEVICE

Takahiro Yamauchi, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Nov. 15, 1988, Ser. No. 271,301
Claims priority, application Japan, Nov. 16, 1987, 62-287288
Int. Cl.[5] G03F 9/00
U.S. Cl. 430—312 **6 Claims**

1. A process for forming a fine pattern in a semiconductor device, comprising the steps of:

(a) forming on an underlying layer an underlayer resist photosensitive to deep ultraviolet light, said underlayer resist being made of chloromethylated polystyrene and which is developed with a mixed solvent of isoamyl acetate and ethyl cellosolve acetate in the step of developing said underlayer resist;

(b) forming an interlayer as a barrier or isolation layer on said underlayer resist;

(c) forming on said interlayer an upper layer polymeric film comprising a material so photoresistive to ultraviolet light as to be rendered opaque to deep ultraviolet light upon exposure thereof to ultraviolet light to form a laminated structure;

(d) exposing said laminated structure through a mask to ultraviolet light to form in said upperlayer polymeric film an area transparent to deep ultraviolet light and an area opaque to deep ultraviolet light;

(e) subjecting said exposed laminated structure to blanket exposure to deep ultraviolet light;

(f) removing said upperlayer polymeric film;

(g) removing said interlayer; and

(h) developing said underlayer resist.

5,024,920

PROCESS FOR FORMING A PATTERN USING A PHOTOSENSITIVE AZIDE AND A HIGH-MOLECULAR WEIGHT COPOLYMER OR POLYMER

Hajime Morishita, Tokyo; Nobuaki Hayashi, Saitama; Saburo Nonogaki, Tokyo; Michiaki Hashimoto, Sayama; Masato Ito, Kokubunji; Masahiro Nishizawa; Kiyoshi Miura, both of Mobara, and Yoshiyuki Odaka, Chiba, all of Japan, assignors to Hitachi, Ltd., Japan

Filed May 23, 1989, Ser. No. 355,635
Claims priority, application Japan, May 31, 1988, 63-134177
Int. Cl.[5] G03C 5/00, 16/95; G03F 7/012
U.S. Cl. 430—325 **1 Claim**

1. A process for forming a pattern which comprises the steps of:

forming, on a surface on which to form a desired pattern, a coating of a photosensitive composition comprising a copolymer containing at least a water-soluble nonphotosensitive monomer unit having an electrolytic functional group and another monomer unit having an azido group and an electrolytic functional group, and a water-soluble high molecular copolymer or polymer which reacts with said copolymer and exhibits reciprocity law failure characteristic and having an electrolytic functional group,

exposing the coating of the photosensitive composition according to a desired pattern under the conditions that oxygen is present, and

developing the coating to form the pattern of areas which are substantially smaller than irradiated areas.

5,024,921

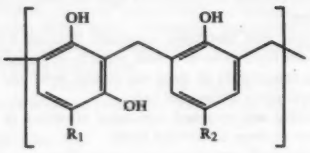
THERMALLY STABLE LIGHT-SENSITIVE COMPOSITIONS WITH O-QUINONE DIAZIDE AND PHENOLIC RESIN USED IN A METHOD OF FORMING A POSITIVE PHOTORESIST IMAGE

Andrew J. Blakeney, Seekonk, Mass.; Alfred T. Jeffries, III, and Thomas R. Sarubbi, both of Providence, R.I., assignors to OCG Microelectronic Materials, Inc., Cheshire, Conn.

Division of Ser. No. 325,399, Mar. 20, 1989, Pat. No. 4,970,287, which is a division of Ser. No. 124,227, Nov. 23, 1987, Pat. No. 4,837,121. This application Sep. 21, 1990, Ser. No. 552,394
Int. Cl.[5] G03C 5/18, 1/60, 1/54
U.S. Cl. 430—326 **3 Claims**

1. The process of developing an image-wise exposed photoresist-coated substrate comprising:

(1) coating said substrate with a light-sensitive composition useful as a positive working photoresist, said composition comprising an admixture of o-quinonediazide compound and a binder resin comprising at least about 40% by weight of units of the formula (I):



(I)

wherein R_1 is a halogen atom and R_2 is a lower alkyl group having 1 to 4 carbon atoms, the amount of said o-quinonediazide compound being about 5% to about 30% by weight and the amount of said binder resin being about 60% to 95% by weight, based on the total solid content of said photosensitive composition;

(2) subjecting said coating on said substrate to an image-wise exposure of radiant light energy; and

(3) subjecting said image-wise exposed coated substrate to a developing solution wherein the exposed areas of said light-exposed coating are dissolved and removed from the substrate, thereby resulting in positive image-wise pattern in the coating.

5,024,922

POSITIVE WORKING POLYAMIC ACID/IMIDE AND DIAZOQUINONE PHOTORESIST WITH HIGH TEMPERATURE PRE-BAKE

Mary G. Moss, Rte. 6, Box 455; Terry Brewer, Rte. 2, Box 297; Ruth M. Cuzmar, 1301 Powell, all of Rolla, Mo. 65401; Dan W. Hawley, 607 E. Springfield, St. James, Mo. 65401, and Tony D. Flaim, Rte. 3, Box 3257, St. James, Mo. 65559

Filed Nov. 7, 1988, Ser. No. 268,023

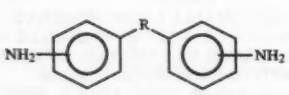
Int. Cl.[5] G03F *7/023, 7/38*

U.S. Cl. 430—330 **9 Claims**

1. A method for making an improved positive-working polyamic acid/imide photoresist composition having improved dielectric properties comprising;

a. admixing,

(i) the condensation product of an aromatic dianhydride and an aromatic di-primary amine having from about 10 to about 50 mole percent of the di-primary amine having the formula:



wherein R, contains 1 or more phenyl rings connected by oxygen, SO_2, alkyl, fluoroalkyl, or biphenyl linkages and

(ii) diazoquinone photoactive sensitizer of the type "whose photosensitivity" normally degrades at temperatures above about 110° C., and

b. applying the mixture of sub-paragraph (a), as a thin film onto a microelectronic substrate;

c. pre-baking the composition at from about 130° C. to about 150° C.;

d. exposing the pre-baked composition to light through a mask image, and developing the light-exposed composition to obtain a positive image of high resolution.

5,024,923

INFRARED ABSORBENT COMPOSITIONS

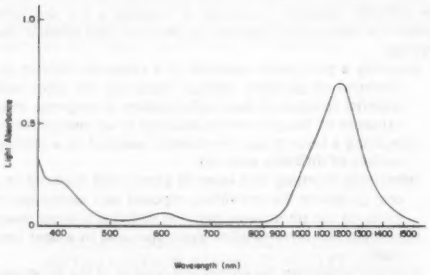
Yoshiaki Suzuki, and Gouichi Hayashi, both of Minamiashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 9, 1988, Ser. No. 242,691

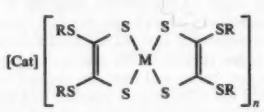
Claims priority, application Japan, Sep. 9, 1987, 62-226133; Sep. 19, 1987, 62-234103

Int. Cl.[5] G02B *5/20;* **F21V** *9/04*

U.S. Cl. 430—372 **24 Claims**



1. An infrared absorbent composition comprising the metal complex compound represented by formula (I):



(I)

wherein represents a cation necessary for neutralizing the complex; n represents 1 or 2; M represents Cu, Co, Ni, Pd, or Pt; and R represents a substituted or an unsubstituted alkyl group, a substituted or an unsubstituted aryl group, or a substituted or an unsubstituted heterocyclic group; and two R's in the same ligand may combine with each other to form a ring, and a high molecular weight binder therefor.

5,024,924

METHOD FOR PROCESSING SILVER HALIDE COLOR PHOTOGRAPHIC MATERIALS

Hideaki Naruse; Osamu Takahashi; Nobutaka Ohki, and Michio Ono, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

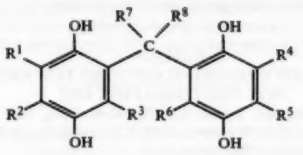
Filed Oct. 27, 1989, Ser. No. 427,381

Claims priority, application Japan, Oct. 28, 1988, 63-272131

Int. Cl.[5] G03C *7/00*

U.S. Cl. 430—376 **3 Claims**

1. A method for continuously processing a silver halide color photographic material comprising a support having thereon at least one silver halide emulsion layer with a color developing bath which contains at least one primary aromatic amine color developing agent, wherein (1) at least one compound represented by formula (II) is present in said silver halide emulsion layer in an amount of from 3 to 10 mol % per mol of coupler in the layer in which the compound is added and (2) said silver halide emulsion layer contains silver chlorobromide or silver chloride having a silver iodide content of not more than 0.2 mol %, and said silver halide color photographic material is processed with said color developing bath where the replenishment rate is from 20 ml to 120 ml per square meter of the silver halide color photographic material processed:



(II)

wherein R^1, R^2, R^3, R^4, R^5 and R^6, which may be the same or different each represents a hydrogen atom, a halogen atom, a sulfo group, a carboxyl group, a cyano group, an alkyl group, an aryl group, an acyl group, an amino group, a sulfonamide group, an alkoxy group, an aryloxy group, an alkylthio group, an arylthio group, an acyl group, an acyloxy group, a carbamoyl group, an alkoxy-carbonyl group or a sulfamoyl group, and R^1 and R^2, and R^4 and R^5, may together form a carbocyclic ring or a heterocycle ring; R^7 represents a hydrogen atom and R^8 represents a methyl group, an ethyl group or an n-propyl group.

5,024,925

METHOD OF FORMING COLOR IMAGE FROM A COLOR REVERSAL PHOTOGRAPHIC MATERIAL COMPRISING A SPECIFIED IODIDE CONTENT AND SPECTRAL DISTRIBUTION

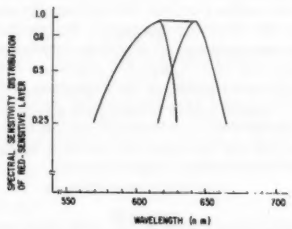
Naoyasu Deguchi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 21, 1989, Ser. No. 383,393

Claims priority, application Japan, Jul. 21, 1988, 63-182671

Int. Cl.[5] G03C *7/16, 1/46*

U.S. Cl. 430—379 **12 Claims**



1. A method of forming a color image which comprises subjecting a silver halide color reversal photographic material to imagewise exposure and then to color reversal processing, said color reversal processing comprising a black-and-white development as a first development followed by a reversal and a color development, said color reversal photographic material comprising a support having provided thereon at least one cyan coupler-containing red-sensitive silver halide emulsion layer, at least one magenta coupler-containing green-sensitive silver halide emulsion layer and at least one yellow coupler-containing blue-sensitive silver halide emulsion layer with the light-sensitive silver halide emulsions in said photographic material having an average silver iodide content of up to 5 mol %, a wavelength corresponding to the peak of spectral sensitivity distribution of said red-sensitive emulsion layer is in a range between 615 nm and 640 nm, a wavelength in shorter wavelength side of the spectral sensitivity distribution at which the sensitivity is 80% of the peak is in the range between 600 and 633 nm, a wavelength at which the sensitivity is 50% of the peak is in a range between 585 and 625 nm, a wavelength at which the sensitivity is 25% of the peak is in a range between 570 and 615 nm, a wavelength in longer wavelength side of the spectral sensitivity distribution at which the sensitivity is 80% of the peak is in a range between 620 and 648 nm, a wavelength at which the sensitivity is 50% of the peak is in a range between 625 and 655 nm, a wavelength at which the sensitivity is 25% of the peak is in a range between 630 and 665 nm, and the wavelength difference between the wavelength on the longer wavelength side at which the sensitivity is 25% of the peak and that on the shorter wavelength side at which the sensitivity is 25% of the peak is in a range of 90 to 30 nm, and the light-sensitive emulsion layers and/or a substantially light-insensitive hydrophilic colloidal layer has a means for providing interimage effect.

5,024,926

ALKYLPHTHALOCYANINE NEAR-INFRARED ABSORBERS AND RECORDING/DISPLAY MATERIALS USING THE SAME

Hisato Itoh, Yokohama; Katashi Enomoto, Zushi; Takahisa Oguchi, and Tsutomu Nishizawa, both of Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo and Yamamoto Chemicals, Incorporated, Yao, both of Japan

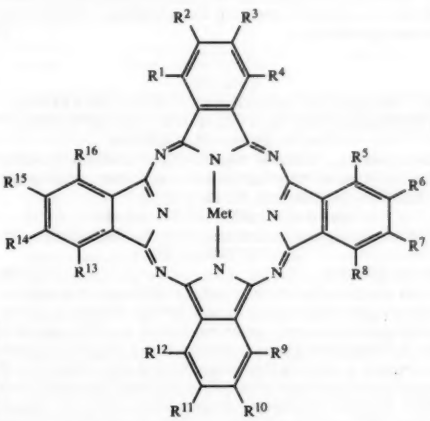
Continuation of Ser. No. 331,736, Apr. 3, 1989, abandoned. This application Oct. 1, 1990, Ser. No. 593,255

Claims priority, application Japan, Apr. 1, 1988, 63-78049; Jun. 2, 1988, 63-134446

Int. Cl.[5] G03C *1/00;* **C09B** *47/04;* **G11B** *7/24*

U.S. Cl. 430—495 **8 Claims**

1. A near-infrared absorber comprising a phthalocyanine derivative of the formula (I)



(I)

wherein R^1, R^4, R^5, R^8, R^9, R^{12}, R^{13} and R^{16} independently are alkyl, arylmethyl, alkoxymethyl, alkylthiomethyl, alkylaminomethyl, dialkylaminomethyl, aryloxymethyl, arylthiomethyl, arylaminomethyl, diarylaminomethyl or alkylarylaminomethyl, wherein the total number of carbon, oxygen, nitrogen and sulfur atoms present in each of R^1, R^4, R^5, R^8, R^9, R^{12}, R^{13} and R^{16} is in the range of 5 to 12; R^2, R^3, R^6, R^7, R^{10}, R^{11}, R^{14} and R^{15} independently are hydrogen, alkyl, arylmethyl, alkoxymethyl, alkylthiomethyl, alkylaminomethyl, dialkylaminomethyl, aryloxymethyl, arylthiomethyl, arylaminomethyl, diarylaminomethyl, alkylarylaminomethyl, alkylthio, arylthio, alkoxy, aryloxy or aryl, but none of R^2, R^3, R^6, R^7, R^{10}, R^{11}, R^{14} and R^{15} is hydrogen when all of R^1, R^4, R^5, R^8, R^9, R^{12}, R^{13} and R^{16} are all either aryloxymethyl or arylthiomethyl; and Met is two hydrogen atoms, a divalent metal atom, a monosubstituted trivalent metal atom, a disubstituted tetravalent metal atom or an oxymetal group.

5,024,927

INFORMATION RECORDING MEDIUM

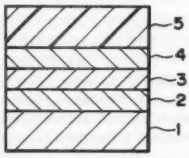
Katsuyuki Yamada, Yokohama; Yukio Ide, Mishima; Makoto Harigaya, Hiratsuka, and Hiroko Iwasaki, Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 4, 1989, Ser. No. 417,541

Claims priority, application Japan, Oct. 6, 1988, 63-252764; Nov. 18, 1988, 63-290177; Mar. 10, 1989, 1-056188; Mar. 29, 1989, 1-074973; Mar. 29, 1989, 1-077838; May 16, 1989, 1-122039; Aug. 28, 1989, 1-218650

Int. Cl.[5] G03C *1/00*; G11B *7/24*

U.S. Cl. 430—495 3 Claims



1. An information recording medium capable of recording information reversibly with application of electromagnetic waves with different powers or wavelengths, comprising a substrate, and a recording layer formed thereon which comprises (a) a carbon-based material and (b) an optically reversible material whose optical characteristics can be reversibly changed, with the thermal decomposition temperature of said carbon-based material being higher than the melting point of said optically reversible material, wherein said carbon-based material is a polymer prepared by subjecting a pigment to plasma polymerization.

5,024,928

SILVER HALIDE MULTILAYER COLOR REVERSAL PHOTOGRAPHIC MATERIAL HAVING IMPROVED COLOR REPRODUCIBILITY

Marco Loiacono, Albissola Superiore, and Giuseppe Loviglio, Savona, both of Italy, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

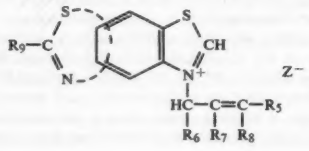
Filed Jul. 17, 1989, Ser. No. 381,098

Claims priority, application Italy, Jul. 19, 1988, 21411 A/88

Int. Cl.[5] G03C *1/46*

U.S. Cl. 430—504 7 Claims

1. A silver halide color reversal multilayer photographic material comprising a support base having thereon a yellow dye image-forming unit containing at least one blue-sensitive silver halide emulsion layer associated with a yellow dye-forming coupler, a magenta dye image-forming unit containing at least one green-sensitive silver halide emulsion layer associated with a magenta dye-forming coupler and a cyan dye image-forming unit containing at least one red-sensitive silver halide emulsion layer associated with a cyan dye-forming coupler, characterized in that said at least one blue-sensitive silver halide emulsion layer comprises a monomethine cyanine spectral sensitizing dye and a thiazole quaternary salt compound having attached to a quaternary nitrogen atom thereof an alkenyl group having a double bond in β-position, said salt compound improving the color reproducibility of the yellow dye and said thiazole quaternary salt compound is represented by the general formula (IV)



wherein R_5, R_6, R_7, R_8 and R_9 each represents a hydrogen atom or a lower alkyl group and Z is an anion.

5,024,929

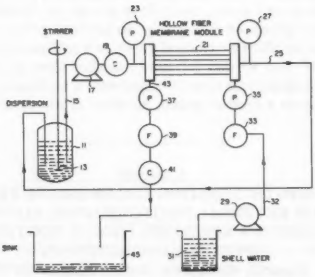
METHOD OF PREPARING COUPLER DISPERSIONS FOR PHOTOGRAPHIC USE

Edgar P. Lougheed, Byron; Carl B. Richenberg, Batavia, and Stephen P. Chen, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 30, 1990, Ser. No. 516,955

Int. Cl.[5] G03C *7/32*

U.S. Cl. 430—546 9 Claims



1. A method of preparing a coupler dispersion in gelatin which comprises milling a coupler, a coupler solvent and an auxiliary coupler solvent with an aqueous gelatin solution to form a discontinuous organic phase of submicron droplets containing the coupler, coupler solvent and auxiliary coupler solvent in a continuous aqueous phase of gelatin in water, separating the auxiliary coupler solvent from the organic phase by passing the dispersion containing the auxiliary coupler solvent over one surface of a hydrophilic membrane having an average pore size of less than 175 angstroms while passing water over the other surface of the membrane, said separation step being conducted at a temperature above the point of incipient gelation and for a time sufficient to reduce the concentration of the auxiliary coupler solvent in the dispersion to a concentration less than 1 weight percent.

5,024,930

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL CONTAINING A NOVEL PHOTOGRAPHIC COUPLER

Hiroshi Kita, Hachioji; Hajime Wada, Tokyo, and Yutaka Kaneko, Sagamihara, all of Japan, assignors to Konica Corporation, Tokyo, Japan

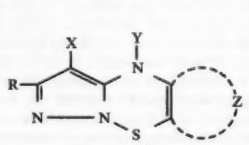
Filed May 16, 1990, Ser. No. 523,876

Claims priority, application Japan, May 18, 1989, 1-125052

Int. Cl.[5] G03C *7/38*

U.S. Cl. 430—558 9 Claims

1. A silver halide light-sensitive photographic material comprising a support and provided thereon photographic component layers including a silver halide light-sensitive emulsion layer containing a compound represented by the following Formula I:



wherein R represents a hydrogen atom or a substituent; X and Y represent independently a hydrogen atom or a group capable

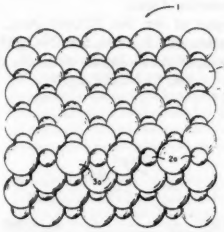
of splitting off upon a reaction with an oxidation product of a developing agent; Z represents a nonmetallic group of atoms necessary to form a benzene ring, a naphthalene ring or a 5 to 7-membered heterocyclic ring; and n represents an integer of 1 or 2.

5,024,931

PHOTOGRAPHIC EMULSIONS SENSITIZED BY THE INTRODUCTION OF OLIGOMERS

Francis J. Evans, Rochester; Ralph W. Jones, Jr., Hilton, and Robert D. Wilson, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 5, 1990, Ser. No. 461,504
Int. Cl.[5] G03C *1/035*
U.S. Cl. 430—567 **20 Claims**



1. A photographic silver halide emulsion comprised of radiation sensitive silver halide grains exhibiting a face centered cubic crystal lattice structure containing, on average, at least one pair of metal ions chosen from group VIII, periods 5 and 6, at adjacent cation sites of the crystal lattice.

5,024,932

LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIAL

Masaki Tanji, and Toyoki Nishijima, both of Odawara, Japan, assignors to Konica Corporation, Tokyo, Japan

Continuation of Ser. No. 259,535, Oct. 18, 1988, abandoned. This application Feb. 26, 1990, Ser. No. 489,748
Claims priority, application Japan, Nov. 6, 1987, 62-281822
Int. Cl.[5] G03C *1/02, 1/30*
U.S. Cl. 430—567 **13 Claims**

1. A light-sensitive silver halide photographic material comprising a support and provided thereon photographic component layers including at least one light-sensitive silver halide emulsion layer containing sillver halide grains having a silver chloride content of not less than 90 mole % and having been subjected to gold sensitization, said photographic component layer containing a gelatin of which isoelectric point being 4.0 to 5.0 and the film pH of said photographic component layer being not more than 6.0.

5,024,933

METHOD AND KIT FOR SAMPLE ADHERENCE TO TEST SUBSTRATE

Huey-Lang Yang, Tenafly, N.J.; John Todd, Mundelein, Ill., and Huey-Ling L. Jou, Harrison, N.J., assignors to Enzo Biochem, Inc., New York, N.Y.

Filed May 10, 1988, Ser. No. 192,256
Int. Cl.[5] C12Q *1/68;* G01N *1/00, 1/28*
U.S. Cl. 435—6 **32 Claims**

1. A method of treating a sample suspected of containing a target polynucleotide so as to adhere the sample to a substrate under conditions suitable for nucleic acid hybridization, which method comprises:

(a) depositing onto said substrate an adhesive composition which comprises an isolate of a naturally occurring mussel adhesive protein;

(b) adhering said sample onto at least a portion of the substrate to which said adhesive composition has been deposited; and

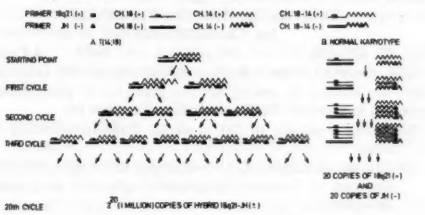
(c) treating said adhered sample so as to prepare said sample for nucleic acid hybridization.

5,024,934

DETECTION OF MINIMAL NUMBERS OF NEOPLASTIC CELLS CARRYING DNA TRANSLOCATIONS BY DNA SEQUENCE AMPLIFICATION

Ming-Sheng Lee, Houston, Tex., assignor to The Board of Regents, The University of Texas System, Austin, Tex.

Filed Mar. 14, 1988, Ser. No. 167,585
Int. Cl.[5] C12Q *1/68;* C07H *15/12;* C12N *15/00*
U.S. Cl. 435—6 **26 Claims**



1. A method for detecting neoplastic cells in an individual, said neoplastic cells being characterized by a t(14;18) chromosomal translocation related to a specific breakpoint clustering region, the method comprising the steps of:

incubating a mixture comprising deoxyribonucleotide triphosphates, DNA from a cell sample of the individual, DNA polymerase, a first oligonucleotide primer and a second oligonucleotide primer, consisting essentially of base sequence 5'-TTTGACCTTTAG-3' or an oligonucleotide competing with said first primer for hybridizing to at least a portion of (−)-strand DNA of chromosome 18q21 immediately 5' to a molecular breakpoint hot spot region located in exon 3 and said second primer consisting essentially of base sequence 3'-CAGAGGAGTCCA-5= or an oligonucleotide competing with said second primer for hybridizing to a sequence 3' to an end of segment J_H of chromosome 14 immunoglobulin heavy chain gene wherein is located a breakpoint clustering region, said incubating promoting annealing of the primers to the translocation crossover site and synthesis of coding or non-coding translocation DNA sequences and a substantial portion of flanking DNA sequences, the incubation then being terminated by DNA denaturation;

repeating said incubation step without adding further cell sample in a cyclic manner to facilitate duplication of the original and newly synthesized translocated and substantial flanking DNA sequences, said repeating being carried out in a manner exponentially amplifying DNA sequences between and including DNA regions complementary to the first and second oligonucleotide primers; and

analyzing the exponentially amplified DNA for oligonucleotide sequences characterizing the translocation region by separating the exponentially amplified DNA and hybridizing the amplified DNA with the first and second primers and identifying neoplastic cells by the presence of said sequences.

5,024,935

DYE-PROVIDING COMPOSITION, DIAGNOSTIC TEST KIT AND THEIR USE IN METHOD FOR LIGAND DETERMINATION USING PEROXIDASE LABELED-RECEPTOR

Gregory J. McClune, and John F. Bishop, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 18, 1987, Ser. No. 136,166
Int. Cl.[5] G01N *33/53, 33/536;* C12Q *1/28;* C12N *9/96*
U.S. Cl. 435—7.1 21 Claims

1. An aqueous dye-providing composition comprising a water-soluble or -dispersible polymer, an electron transfer agent, and an imidazole leuco dye which provides a dye in the presence of hydrogen peroxide and a peroxidative substance,

the weight ratio of polymer to leuco dye being from about 10,000:1 to about 100:1,

said polymer selected from the group consisting of vinylpyrrolidone polymers, acrylamide polymers, acrylic and methacrylic acid polymers, polyethylene glycols and polyamines.

5,024,936

ASSESSING FETAL LUNG MATURITY

James Macri, 170 Sidney St., Oyster Bay, N.Y. 11771

Filed Sep. 26, 1988, Ser. No. 249,326
Int. Cl.[5] C12Q *1/28*
U.S. Cl. 435—28 4 Claims

1. A method for the determination of whether the lungs of a fetus are mature by testing for the presence of phosphatidyl glycerol in amniotic fluid comprising the steps of:

obtaining a sample of the amniotic fluid surrounding the fetus;

adding phospholipase C to the sample to create a first mixture and to convert phosphatidyl glycerol to glycerol phosphate;

adding glycerol-3-phosphate oxidase to the first mixture to create a second mixture and to convert the glycerol phosphate to dihydroxyacetone phosphate and hydrogen peroxide;

adding a substrate that will react with the dihydroxyacetone phosphate and a peroxidase in a visibly detectable reaction to the second mixture to create a third mixture and to react the substrate with the dihydroxyacetone phosphate;

passing the third mixture through a membrane having peroxidase bound thereto to create a visibly detectable spot on the membrane through the reaction of the peroxidase, the dihydroxyacetone phosphate, the hydrogen peroxide and the substrate; and,

detecting the presence or absence of the visibly detectable spot on the membrane, the presence of the visibly detectable spot indicating that the fetal lungs are mature and the absence of the visibly detectable spot indicating that the fetal lungs are not mature.

5,024,937

METHOD FOR PROCESSING AQUEOUS FERMENTATION BROTHS

Amy M. Penticoff, and John D. Lyon, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Apr. 6, 1989, Ser. No. 333,677
Int. Cl.[5] C12N *1/00, 1/34;* C12R *1/865*
U.S. Cl. 435—41 6 Claims

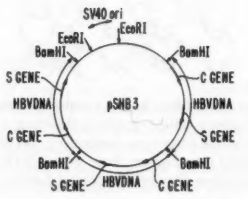
1. In a method for processing aqueous fermentation broths in a bioreactor vessel, in which a foam inhibitor is added to the fermentation broth in the bioreactor vessel in order to prevent the accumulation and buildup of foam in the bioreactor vessel caused by oxygen sparging of the fermentation broth contained therein, and in which the aqueous fermentation broth processed in the bioreactor vessel is conveyed as a feed solution to an ultrafiltration system including a membrane for concentrating the aqueous fermentation broth, the ultrafiltration system being located downstream of the bioreactor vessel, the improvement comprising reducing the amount of fouling of the membrane in the ultrafiltration system by adding to the aqueous fermentation broth in the bioreactor vessel as the foam inhibitor, an antifoam which is an oil based liquid in the form of droplets, the droplets of the oil based liquid antifoam being dispersed, encased, entrapped, and imbedded, within solid particles of a water soluble encapsulating material.

5,024,938

RECOMBINANT DNA INSERTED WITH HEPATITIS B VIRUS GENE, MAMMALIAN CELLS TRANSFORMED WITH CLONED VIRAL DNA, AND PRODUCTION OF HEPATITIS B VIRUS PROTEINS

Chikateru Nozaki, Kumamoto; Atsushi Miyanohara, Neyagawa; Fukusaburo Hamada; Nobuya Ohtomo, both of Kumamoto, and Kenichi Matsubara, Osaka, all of Japan, assignors to Juridical Foundation The Chemo-Sero-Therapeutic Research Institute, Kumamoto, Japan

Continuation-in-part of Ser. No. 522,667, Aug. 12, 1983. This application Jul. 8, 1986, Ser. No. 883,138
Claims priority, application Japan, Aug. 20, 1982, 57-145092
Int. Cl.[5] C12P *21/00*
U.S. Cl. 435—68.1 8 Claims



1. A recombinant DNA capable of replication in mammalian cells, which comprises

3 fragments of Hepatitis B virus subtype adr (HBV) DNA recombined with a vector,

said vector comprising essentially of 0.31 Kb replication origin SV40 DNA inserted into the EcoRI cleavage site of *Escherichia coli* plasmid pBR322, wherein said plasmid is deficient in the 1.426–2.521 Kb region of inhibiting replication in mammalian cells and has an antibiotic resistant gene as a selective marker,

wherein each of said HBV DNA fragments is comprised of a 3.2 Kb DNA having the BamHI site at both terminal ends, said BamHI DNA consisting of a 1.9 Kb HBc gene and a 1.3 Kb HBs gene, wherein said HBV DNA fragments are arranged in a head-to-tail tandem relationship wherein the HBc gene positions at the head and the HBs gene positions at the tail.

5,024,939

TRANSIENT EXPRESSION SYSTEM FOR PRODUCING RECOMBINANT PROTEIN

Cornelia M. Gorman, San Francisco, Calif., assignor to Genentech, Inc., South San Francisco, Calif.

Continuation-in-part of Ser. No. 71,674, Jul. 9, 1987, abandoned, which is a continuation-in-part of Ser. No. 907,185, Sep. 12, 1986, abandoned. This application Sep. 25, 1987, Ser. No. 101,712
Int. Cl.[5] C12N *15/67*
U.S. Cl. 435—69.1 27 Claims

1. A method for the enhanced transient expression of a desired protein in a host kidney cell comprising:

a) providing a host kidney cell which expresses an adenovirus trans-activating protein;

b) transfecting said host kidney cell with a vector comprising DNA encoding the desired protein under the control of a cytomegalovirus promoter; and,

c) culturing said host kidney cell for a period comprising 1 to

14 days under conditions favorable for transient production of the desired protein.

5,024,940

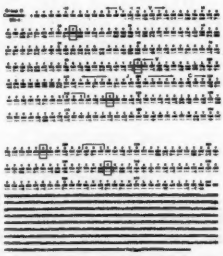
NUCLEIC ACIDS ENCODING THE DELTA CHAIN OF THE T CELL ANTIGEN RECEPTOR

Michael B. Brenner, Ashland; Jack L. Strominger, Lexington; Jonathan Seidman, Milton; Stephen H. Ip, Framingham, and Michael S. Krangel., Newtonville, all of Mass., assignors to T Cell Sciences, Inc., Cambridge; Dana-Farber Cancer Institute, Boston and President & Fellows of Harvard College, Cambridge, all of Mass.

Continuation-in-part of Ser. No. 16,252, Feb. 19, 1987, which is a continuation-in-part of Ser. No. 882,100, Jul. 3, 1986, abandoned. This application Oct. 29, 1987, Ser. No. 115,256

Int. Cl.[5] C12N *15/12*

U.S. Cl. 435—69.1 **47 Claims**



1. A substantially pure nucleotide sequence comprising the nucleotide sequence substantially as shown in FIG. 15 designated "Group O Composite," encoding a delta chain of a T cell antigen receptor polypeptide.

5,024,941

EXPRESSION AND SECRETION VECTOR FOR YEAST CONTAINING A GLUCOAMYLASE SIGNAL SEQUENCE

Gregory T. Maine, Watertown; Robert S. Daves, Reading, and Robert R. Yocum, Arlington, all of Mass., assignors to BioTechnica International, Inc., Cambridge, Mass.

Filed Dec. 18, 1985, Ser. No. 810,423

Int. Cl.[5] C12P *21/00;* **C12N** *15/00, 5/03*

U.S. Cl. 435—69.9 **10 Claims**

1. A vector comprising

a DNA sequence encoding a secretory signal sequence of a DEX4 glucoamylase gene from *Saccharomyces diastaticus* or *S. cerevisiae;*

upstream from said signal-encoding sequence, a DNA sequence capable of promoting transcription in yeast, transcription of said signal-encoding sequence being under the control of said transcription-promoting sequence; and

downstream from said signal-encoding sequence, a site for the insertion into said vector of a heterologous DNA sequence, encoding a secretable protein in reading frame with said signal-encoding sequence.

5,024,942

BIOCHEMICAL PROCESS FOR REACTING HYDROPHOBIC AND HYDROPHILIC SUBSTRATES AND APPARATUS THEREFOR

Shoichi Shimizu, and Tsuneo Yamane, both of Aichi, Japan, assignors to Nippon Oil and Fats Co., Ltd., Tokyo, Japan

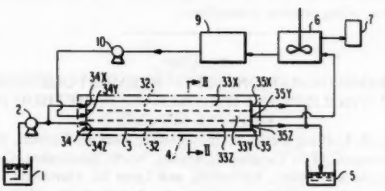
Filed Feb. 17, 1984, Ser. No. 581,018

Claims priority, application Japan, Feb. 21, 1983, 58-28325

Int. Cl.[5] C12P *7/64, 7/62;* **C12M** *1/40*

U.S. Cl. 435—134 **8 Claims**

1. A biochemical process comprising reacting a (a) hydrophobic substrate with (b) a solution or dispersion comprising a hydrophilic substrate and an enzyme catalyst, wherein said reacting is carried out by contacting said hydrophilic substrate and said hydrophobic substrate, which are separated by a porous thin membrane and do not intermingle, through the micropores of said porous thin membrane, wherein said porous



thin membrane has a pore size of about 0.05 to 10 μm and a thickness of about 10 to 100 μm, and wherein said hydrophilic substrate and said hydrophobic substrate are incompatible with each other.

5,024,943

REGULATORY REGION CLONING AND ANALYSIS PLASMID FOR BACILLUS

Jan H. Van Ee, Nieuwerkerk a/d Ijssel, Netherlands, assignor to Gist-brocades, Delft, Netherlands

Filed Nov. 4, 1986, Ser. No. 927,249

Claims priority, application Netherlands, Nov. 7, 1985, 8503074

Int. Cl.[5] C12N *15/00, 1/20*

U.S. Cl. 435—172.3 **18 Claims**

1. A plasmid capable of replication in Bacillus useful for evaluating regulatory or signal sequences for expression of a hybrid gene, said plasmid comprising:

a domain comprising at least one unique restriction site and as elements for substitution, in the direction of transcription,

(1) a promoter region functional in Bacillus selected from the group consisting of:

(i) the *B. licheniformis* promoter sequence from pROM-3-4C,

(ii) the bacteriophage promoter of pROM SP02,

(iii) the −10 or −35 region of a synthetic promoter comprising at least a portion of the sequence

AATTCTTGACAAAGCTTCTC
GAACTGTTTCGAAGAG

GAGACTGATATAATGAGCT
CTCTGACTATATTAC

and (iv) the −10 or −35 region of a synthetic promoter comprising at least a portion of the sequence

AATTCAGGATTTATGAAGCTTCT
GTCCTAAATACTTCGAAGA

TCTCGAGGGAATTGTTTGAGCT
AGAGCTCCCTTAACAAAC;

(2) a ribosomal binding site, with the proviso that when said promoter region is absent, said ribosomal binding site is synthetic and consists essentially of:

GATCCAAGGAGGTGAT
GTTCCTCCACTAGATC; and

(3) a signal sequence functional in Bacillus; wherein unique restriction sites are located between the −10 and −35 consensus sequences of any synthetic promoter region, between the promoter region and the ribosomal binding site, proximal to the initiation codon and at the 3′-terminus

of the signal sequence; wherein at least two of said elements are not naturally linked; and wherein when one of said elements other than said signal sequence is unique restriction site, said signal sequence is the α-amylase signal sequence joined in reading frame to a structural gene encoding mature α-amylase.

5,024,944

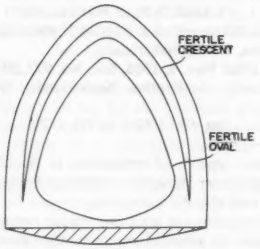
TRANSFORMATION, SOMATIC EMBRYOGENESIS AND WHOLE PLANT REGENERATION METHOD FOR GLYCINE SPECIES

Glenn B. Collins; David F. Hildebrand; Paul A. Lazzeri, all of Lexington, Ky.; Thomas R. Adams, North Stonington, Conn.; Wayne A. Parrott, Versailles, and Lynn M. Hartweck, Lexington, both of Ky., assignors to Lubrizol Genetics, Inc., Wickliffe, Ohio and The University of Kentucky Research Foundation, Inc., Lexington, Ky.

Continuation-in-part of Ser. No. 893,256, Aug. 4, 1986, abandoned. This application Jun. 15, 1987, Ser. No. 63,342

Int. Cl.[5] C12N *15/00, 5/00*

U.S. Cl. 435—172.3 **31 Claims**



10. A method of producing a plant of *Glycine max* containing foreign DNA comprising:

a) macerating cotyledon tissue taken from immature embryos of said species comprising the "fertile crescent" region by crushing on mesh;

b) contacting said macerated tissue with said foreign DNA such that said DNA is incorporated into the cells of said tissue;

c) contacting said macerated tissue of step (b) with an embryogenic medium, which embryogenic medium comprises an auxin of the NAA family at a concentration between about 5 mg/l and about 50 mg/l, for said tissue to produce somatic embryos;

d) transferring said embryos to suitable media for regeneration of whole plants containing foreign DNA therefrom.

5,024,945

PROCESS FOR OBTAINING SARCOSINE OXIDASE FROM MICROORGANISMS

Ulrich Mayr, Rosenheim; Helmgard Gauhl, and Hans Seidel, both of Tutzing, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldorf, Fed. Rep. of Germany

Filed Jul. 10, 1984, Ser. No. 629,504

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1983, 3326888

Int. Cl.[5] C12N *9/06;* **C12P** *13/04*

U.S. Cl. 435—191 **8 Claims**

1. Process for obtaining sarcosine oxidase which catalyzes the reaction between sarcosine and oxygen to form formaldehyde, glycine, and hydrogen peroxide, comprising:

(i) culturing a Pseudomonas strain capable of producing said sarcosine oxidase under conditions favoring production thereof, and

(ii) recovering said sarcosine oxidase.

5,024,946

HUMAN MONOCLONAL ANTIBODY TO ANTIGEN OF GASTRIC CANCER AND B-CELL LINE FOR PRODUCING THIS ANTIBODY, METHOD FOR PREPARING THIS B-CELL LINE AND ANTIBODY, ANTIGEN AND METHOD OF PREPARATION OF THIS ANTIGEN

Tsutomu Abe, Fuji, and Masayuki Fukumoto, Saitama, both of Japan, assignors to Asahi Kasei Kabushiki Kaisha, Osaka, Japan

Filed Sep. 29, 1986, Ser. No. 912,106

Claims priority, application Japan, Sep. 30, 1985, 60-214480; Jun. 4, 1986, 61-128016; Aug. 28, 1986, 61-200080

Int. Cl.[5] C12N *5/24;* **C07K** *15/28*

U.S. Cl. 435—240.27 **2 Claims**

1. The human monoclonal antibody 418-59 produced by the B-cell line which has ECACC Deposit reference number 85071031 and which binds to a gastric cancer cell line.

5,024,947

SERUM FREE MEDIA FOR THE GROWTH ON INSECT CELLS AND EXPRESSION OF PRODUCTS THEREBY

Duane Inlow, and Brian Maiorella, both of Oakland, Calif., assignors to Cetus Corporation, Emeryville, Calif.

Filed Jul. 24, 1987, Ser. No. 77,303

Int. Cl.[5] C12N *5/00*

U.S. Cl. 435—240.31 **14 Claims**

1. A serum free medium which supports the large scale growth of insect cells, excluding monolayer culture, and the production thereby of recombinant and viral products at levels comparable to those achieved in serum containing media, the serum free medium comprises:

(a) a basal medium;

(b) a lipid component;

(c) a peptone component; and

(d) a protective agent;

wherein:

the lipid component is in the form of a microemulsion;

the basal medium comprises a nutrient mixture of inorganic salts, sugars, amino acids, optionally also containing vitamins, organic acids and/or buffers;

the protective agent comprises an emulsifying, non-toxic, water soluble compound that protects the insect cells from damage and death under well-aerated culture conditions, wherein the protective agent is selected from the group consisting of hydroxyethyl starch, methyl cellulose, carboxymethyl cellulose, dextran sulfate, polyvinylpyrrolidone, ficoll, alginic acid, polypropyleneglycol and non-toxic polymeric detergents;

the lipid component further comprises an emulsifier, an organic solvent, and lipids esential for the growth of insect cells;

the emulsifier of the lipid component comprises a phospholipid and/or a non-toxic, nonionic polymeric detergent;

the organic solvent comprises an alcohol containing from one to three carbon atoms;

the lipids of the lipid component are selected from the group consisting of fatty acids, steroids and lipid soluble vitamins; and

the peptone component comprises a hydrolyzed protein product or a mixture of hydrolyzed protein products, the peptone component is at a total concentration of from about 1 g/l to about 12 g/l.

5,024,948

GENETIC SYSTEM FOR MICROMONOSPORA

David M. Rothstein, Rockland; Susan F. Love, Westchester, and Ellen Z. Baum, Rockland, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 787,066, Oct. 17, 1985, abandoned, and Ser. No. 672,031, Nov. 16, 1984, abandoned. This application Mar. 6, 1987, Ser. No. 22,455

Int. Cl.[5] C12N *1/20, 15/01;* C12P *19/44*

U.S. Cl. 435—252.1 1 Claim

1. A culture comprising the microorganism *Micromonospora echinospora* ssp. calichensis DR 46 (ATCC-53591), said culture being capable of producing complementing factor in recoverable quantity upon aerobic fermentation in an aqueous medium containing assimilable sources of carbon, nitrogen, iodine and inorganic salts.

5,024,949

AEROBIC BACTERIAL REMEDIATION OF ALIPHATIC CHLORINATED HYDROCARBON CONTAMINATION

George D. Hegeman, Bloomington, Ind., and David G. Nickens, Eau Claire, Wis., assignors to BioTrol, Inc., Chaska, Minn.

Filed Feb. 17, 1989, Ser. No. 312,599

Int. Cl.[5] C02F *3/34*

U.S. Cl. 435—262 22 Claims

1. A method of detoxifying a liquid contaminated with trichlorethylene (TCE), said method comprising the step of introducing a bacterium of the genus Pseudomonas into a contaminated medium comprising:

a) an amount of a branched chain alkyl-substituted aromatic hydrocarbon effective to sustain growth of the bacterium, and

b) TCE, wherein the bacterium is capable of substantially complete degradation of the TCE at a rate of up to about 32 nmol hr^{-1} mg $cells^{-1}$ based upon the dry weight of the cells, and further wherein the bacterium is capable of sustained growth solely on the branched chain alkyl-substituted aromatic hydrocarbon.

2. The method of claim 1 wherein the branched chain alkyl-substituted aromatic hydrocarbon is isobutylbenzene.

5,024,950

ACTINOMADURA FULVA SUBSP INDICA

Ann C Horan, Summit, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 227,963, Aug. 3, 1988, Pat. No. 4,904,644. This application Jan. 3, 1990, Ser. No. 460,417

Int. Cl.[5] C12N *1/00*

U.S. Cl. 435—825 1 Claim

1. A biologically pure culture of the microorganism *Actinomadura fulva* subsp. *indica,* SCC 1840 having the identifying characteristics of ATCC 53714 said culture being capable of producing the antimicrobial complex in a recoverable quantity upon fermentation, under aerobic conditions in an aqueous medium containing assimilable sources of nitrogen and carbon.

5,024,951

METHOD OF CALIBRATING A SHEET TYPE ELECTRODE

Haruo Kotani, and Katsuhiko Tomita, both of Kyoto, Japan, assignors to Horiba, Ltd., Kyoto, Japan

Division of Ser. No. 124,629, Nov. 24, 1987, abandoned. This application Nov. 28, 1988, Ser. No. 276,779

Int. Cl.[5] G01N *33/00*

U.S. Cl. 436—8 4 Claims

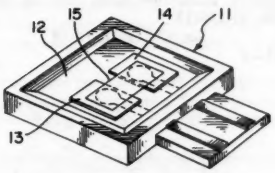
1. A method of calibrating an ion-concentration measuring device with an electrode, comprising the steps of:

providing a water-absorbing sheet of a chemically stabilized hygroscopic material that will not elute ions;

absorbing a calibrating solution of a predetermined concentration of pH calibrating material having a predetermined pH level into the sheet;

drying the water-absorbing sheet to leave it impregnated with the pH calibrating material from the calibrating solution;

bringing the water-absorbing sheet into contact with an electrode of the ion-concentration measuring device, and



adding an appointed quantity of pure water drop by drop to the sheet to rehydrate the calibrating solution to the predetermined concentration to enable a pH calibration of the measuring device.

5,024,952

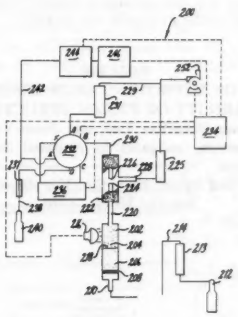
METHOD FOR OBTAINING ANALYTES FROM LIQUID MENSTRUA FOR ANALYSIS

George M. Alsop, South Charleston, W. Va., assignor to Union Carbide Chemicals and Plastics Technology Corporation, Danbury, Conn.

Filed Jun. 26, 1989, Ser. No. 371,112

Int. Cl.[5] G01N *1/18, 35/08, 30/00;* C02F *1/30*

U.S. Cl. 436—177 30 Claims



17. A method for analyzing a menstruum from the presence of at least one solute which, in said menstruum tends to be at a higher concentration at an interface of the menstruum with a gas than in the menstruum as a whole comprising passing a gas in the form of finely-divided bubbles through the menstruum, said bubbles forming an interface with and passing from the menstruum into an immediately adjacent vapor space and entraining some of said menstruum; indicating the vapor space at least in the portion of the vapor space containing said entrained menstruum with an electromagnetic radiation which imparts to the at least one solute in an amount at least sufficient to maintain at least a portion of the at least one solute contained in the entrained menstruum in the vapor space; withdrawing from the vapor space a vapor stream comprising the gas passed through the menstruum and at least one solute; and subjecting at least a portion of the vapor stream to an analytical procedure to ascertain at least one of the presence and relative concentration of the at least one solute.

5,024,953
METHOD FOR PRODUCING OPTO-ELECTRIC TRANSDUCING ELEMENT

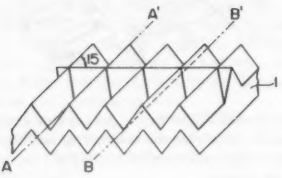
Tsuyoshi Uematsu, Koganei, and Tadashi Saitoh, Tokyo, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 20, 1989, Ser. No. 325,577

Claims priority, application Japan, Mar. 22, 1988, 63-65709; Sep. 12, 1988, 63-226613

Int. Cl.[5] H01L *31/18*

U.S. Cl. 437—2 **9 Claims**



1. A process for producing an opto-electric transducing element, comprising the steps of;

processing a semiconductor substrate having a first electrically conductive type into a corrugated structure;

forming a semiconductor layer having a second electrically conductive type on the face of said substrate;

forming a face electrode on a portion of said semiconductor layer having the second electrically conductive type; and

forming a back electrode on the back of said substrate;

wherein said semiconductor substrate is of a single crystal;

wherein processing of said substrate is conducted by use of an anisotropic etching; and

wherein the angle formed by the direction of a thin linear pattern of an etching mask for said anisotropic etching together with the direction of an intersection between a slowly etched face and the face of said substrate is more than 0° and less than an arctan {(a thin line width—a line width after etching)/a thin line length}.

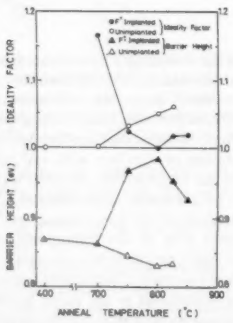
5,024,954
METHOD OF IMPROVING HIGH TEMPERATURE STABILITY OF PTSI/SI STRUCTURE

Mao-Chieh Chen; Bing-Yue Tsui, and Jiunn-Yann Tsai, all of Hsinchu, Taiwan, assignors to National Science Council, Taipei, Taiwan

Filed Apr. 6, 1990, Ser. No. 505,406

Int. Cl.[5] H01L *21/265*

U.S. Cl. 437—24 **21 Claims**



1. In a method of forming a PtSi/Si structure having a PtSi/Si interface, which includes implanting fluorine-containing ions in the PtSi/Si structure and annealing, the improvement wherein any annealing prior to the implanting of fluorine-containing ions is low temperature annealing and high temperature annealing is performed after the implanting of fluorine-containing ions, whereby F^+ ions are concentrated at the PtSi/Si interface and the PtSi/Si structure is sustainable at high temperature.

5,024,955
VARIABLE-CAPACITANCE DIODE ELEMENT HAVING WIDE CAPACITANCE VARIATION RANGE

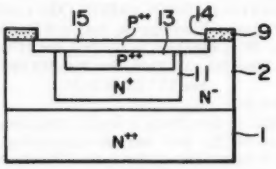
Takeshi Kasahara, Saitama, Japan, assignor to Toko, Inc., Tokyo, Japan

Division of Ser. No. 466,204, Jan. 17, 1990. This application Jun. 13, 1990, Ser. No. 537,689

Claims priority, application Japan, Jan. 19, 1989, 1-10885; Jan. 30, 1989, 1-20496

Int. Cl.[5] H01L *21/74, 21/76*

U.S. Cl. 437—27 **2 Claims**



1. A method of making a variable-capacitance diode element, comprising the steps of:

providing an epitaxial layer of a first conductivity type on a semiconductor substrate of the first conductivity type, said epitaxial layer having a higher resistivity than that of said semiconductor substrate;

implanting an impurity element of the first conductivity type deeply into said epitaxial layer by means of ion implantation and carrying out a first diffusion step, thereby forming a first diffusion layer;

implanting an impurity element of a second conductivity type into a area surrounded by said first diffusion layer, thereby forming a second diffusion layer of the second conductivity type which is shallower than said first diffusion layer and of a lower resistivity than that of said first diffusion layer; and

forming a shallow diffusion layer of the second conductivity type by means of a lamp-annealing procedure in such a manner as to cover a KH portion of said first diffusion layer which is exposed at a major surface of said semiconductor substrate.

5,024,956
METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE INCLUDING MESA BIPOLAR TRANSISTOR WITH EDGE CONTACTS

Johannes W. A. Van Der Velden; Henricus G. R. Maas, and Marguerite M. C. Van Iersel-Schiffmacher, all of Eindhoven, Netherlands, assignors to U. S. Philips Corporation, New York, N.Y.

Division of Ser. No. 506,484, Apr. 6, 1990, Pat. No. 4,969,026, which is a continuation of Ser. No. 308,578, Jan. 24, 1989, abandoned. This application Jun. 7, 1990, Ser. No. 534,774

Claims priority, application Netherlands, Jan. 25, 1988, 8800157

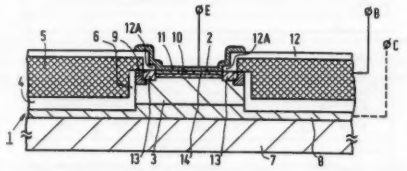
Int. Cl.[5] H01L *21/331*

U.S. Cl. 437—31 **3 Claims**

1. A method of manufacturing a semiconductor device characterized in that

1. a silicon oxide containing insulated intermediate layer is provided on the surface of a monocrystalline silicon region and a first silicon nitride layer is provided on said intermediate layer,

2. a first silicon layer is provided on said first silicon nitride layer,
3. a silicon pattern is etched from the first silicon layer,
4. at least the edge of said silicon pattern is provided by thermal oxidation with an oxide layer,
5. the uncovered part of the first silicon nitride layer, and the subjacent intermediate layer are removed,
6. a depression is etched into the exposed part of the silicon region,
7. the uncovered oxide is removed,
8. the uncovered silicon is provided by thermal oxidation with a further oxide layer,
9. the remaining exposed parts of said first silicon nitride layer and said intermediate layer are removed,
10. a second highly doped silicon layer is provided on the



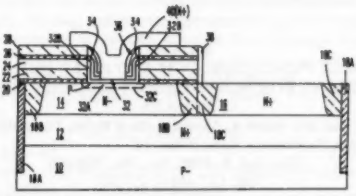
assembly, said second silicon layer being removed by planarization and etching down to a level lying below that of the oxide present on the first silicon layer,
11. the exposed silicon oxide is selectively removed by etching,
12. the exposed parts of said first silicon nitride layer are removed and at least one connection zone is formed by doping in the underlying parts of said silicon region,
13. said first silicon layer is selectively etched away, said second silicon layer and said connection zone are oxidized and at least one first zone is formed by diffusion from said second silicon layer,
14. said first silicon nitride layer is removed, and
15. an electrode is provided on the surface of a second zone located within the window thus formed, which is bounded by said further oxide layer.

5,024,957

METHOD OF FABRICATING A BIPOLAR TRANSISTOR WITH ULTRA-THIN EPITAXIAL BASE

David L. Harame, Mohegan Lake, and Johannes M. C. Stork, Yorktown Heights, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 13, 1989, Ser. No. 309,510
Int. Cl.[5] H01L *21/306*
U.S. Cl. 437—31 **12 Claims**



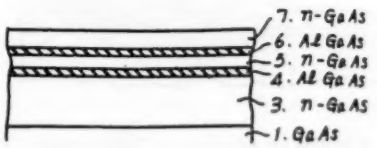
5. A method of forming a bipolar transistor comprising the steps of:
providing a semiconductor substrate including a first region of a first conductivity type;
forming a first layer of insulative material having a first etch characteristic over a surface of said first region;
forming a second layer of insulative material having a second etch characteristic over said first layer of insulative material;
forming a first layer of conductive material over said second layer of insulative material;
forming a third layer of insulative material over said first layer of conductive material;
etching said first layer of conductive material and said second and third layers of insulative material with a first etchant to expose a portion of said first layer of insulative material;
etching the exposed portion of said first layer of insulative material with a second etchant to form a generally vertical sidewall bounding an exposed portion of said first region surface;
epitaxially depositing a base region of a second conductivity type over said exposed portion of said first region surface and said sidewall such that said base region is in electrical contact contact with said first layer of conductive material, and such that an intrinsic portion of said base region overlying said exposed portion of said first region is monocrystalline in structure and an extrinsic portion of said base region overlying said sidewall is polycrystalline in structure;
patterning said extrinsic portion of said base region so that said extrinsic portion of said base region terminates over said layer of conductive material;
forming an insulative spacer over said extrinsic portion of said base region and the exposed portions of said sidewall; and
forming a second region of said first conductivity type over said base region and said spacer.

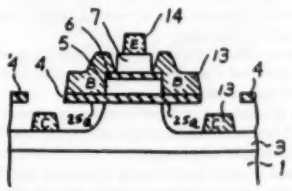
5,024,958

COMPOUND SEMICONDUCTOR DEVICE AND A MANUFACTURING METHOD THEREOF

Yuji Awano, Tokyo, Japan, assignor to 501 Fujitsu Limited, Kawasaki, Japan

Division of Ser. No. 323,978, Mar. 15, 1989, Pat. No. 4,967,252.
This application Oct. 25, 1990, Ser. No. 571,457
Claims priority, application Japan, Mar. 18, 1988, 63-66212
Int. Cl.[5] H01L *21/283, 21/306, 29/73*
U.S. Cl. 437—31 **11 Claims**





1. A method of manufacturing a compound semiconductor device including a substrate, comprising the steps of:
(a) forming a first layer of at least a first compound semiconductor on the substrate so as to form a mesa of the first layer, the mesa having a top area including a contact area;
(b) forming an intermediate layer of a second compound semiconductor on said contact area of said first layer:

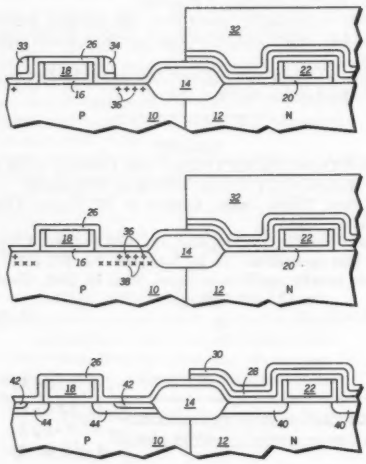
(c) forming a second layer of at least said first compound semiconductor on a region of said intermediate layer overlying at least said contact area so as to form side walls and a top portion of said second layer;
(d) forming an electrode so as to contact said side walls and a part of said top portion of said second layer; and
(e) forming a third layer of said first compound semiconductor overlying said second layer.

5,024,959

CMOS PROCESS USING DOPED GLASS LAYER

James R. Pfiester, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 25, 1989, Ser. No. 412,059
Int. Cl.[5] H01L *21/225, 21/336*
U.S. Cl. 437—34 **8 Claims**



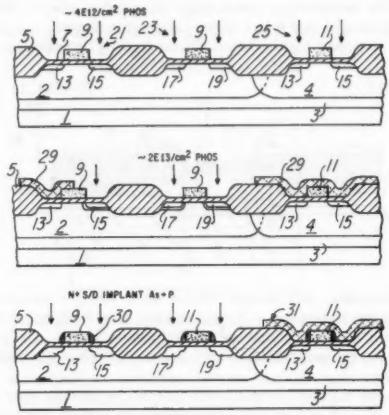
1. A method for fabricating a CMOS integrated device comprising the steps of:
providing a silicon substrate having a first surface region of first conductivity type and a second surface region of second conductivity type;
forming a first silicon gate electrode overlying said first surface region and a second silicon gate electrode overlying said second surface region;
depositing a dopant source layer containing dopant impurities of said first conductivity type overlying said first and second silicon gate electrodes;
patterning said dopant source layer overlying said first silicon gate electrode to form sidewall spacers at edges of said first silicon gate electrode;
doping portions of said first surface region with conductivity determining dopant impurities of said second conductivity type using said sidewall spacers as dopant masks; and
heating said dopant source layer to diffuse dopant impurities therefrom to dope portions of said second surface region with conductivity determining dopant of said first conductivity type.

5,024,960

DUAL LDD SUBMICRON CMOS PROCESS FOR MAKING LOW AND HIGH VOLTAGE TRANSISTORS WITH COMMON GATE

Roger A. Haken, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 62,924, Jun. 16, 1987, abandoned. This application Oct. 18, 1988, Ser. No. 259,226
Int. Cl.[5] H01L *21/265, 21/336*
U.S. Cl. 437—34 **8 Claims**



1. A method of making a CMOS integrated circuit comprising the steps of:
providing a substrate;
defining active regions in said substrate;
forming a gate oxide of a selected thickness over said active regions;
forming at least two gates over each of said active regions to define a source and drain region for a high voltage transistor and a source and drain region for a low voltage transistor;
lightly doping each of said source and drain regions of said high voltage and low voltage transistors with an impurity of a selected type;
doping said source regions of said high voltage and low voltage transistors and said drain region of said low voltage transistor of said active regions with additional impurity of said selected type;
forming a sidewall oxide on each said gate; and
further doping each of said source and drain regions of said high voltage and low voltage transistors with additional impurity of said selected type.

5,024,961

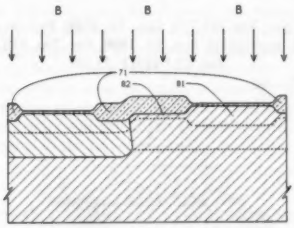
BLANKET PUNCHTHROUGH AND FIELD-ISOLATION IMPLANT FOR SUB-MICRON N-CHANNEL CMOS DEVICES

Ruojia Lee, and Aftab A. Ahmad, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Jul. 9, 1990, Ser. No. 550,000
Int. Cl.[5] H01L *21/265*
U.S. Cl. 437—34 **6 Claims**

6. A method for creating punch-through-resistant regions for N-channel devices and channel-stop regions beneath field oxide regions for CMOS circuitry constructed on a silicon substrate, wherein said method consists of implanting boron atoms following N-well and P-well formation, and a high-temperature oxidation step which creates said field oxide regions, said implanting being performed in blanket fashion with N-

well regions unmasked, and with sufficient energy to penetrate the field oxide regions and create a stratum of high boron atom concentration within the substrate that, in the field oxide regions, is subjacent the field oxide and in N-channel active areas



is subject said implanting being performed at concentrations which are insufficient to counter dope the N-type doping within the N-well regions, and then forming N-channel transistor.

5,024,962

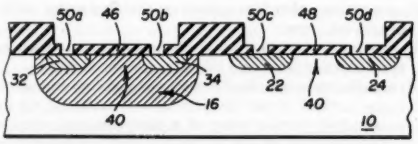
METHOD FOR PREVENTING AUTO-DOPING IN THE FABRICATION OF METAL GATE CMOS DEVICES

Roger W. Murray, Palo Alto, and Nevand Godhwani, Sunnyvale, both of Calif., assignors to Teledyne Industries, Inc., Mountain View, Calif.

Filed Apr. 20, 1990, Ser. No. 511,647

Int. Cl.[5] H01L *21/336*

U.S. Cl. 437—40 **8 Claims**



4. A method of forming a gate oxide for a metal gate field effect transistor formed in a substrate, comprising the sequential steps of:

(a) oxidizing the substrate to form a sealing oxide layer having a thickness of approximately 100–150Å by rapid thermal annealing; and

(b) forming the gate oxide by oxidizing the substrate to form the gate oxide.

5,024,963

METHOD OF FABRICATING A BCCD CHANNEL WITH STAIR-CASE DOPING BY SELF-ALIGNMENT

Yong Park, Anyang, and Seo K. Lee, Seongnam, both of Rep. of Korea, assignors to Goldstar Electron Co., Cheongji, Rep. of Korea

Filed Jul. 16, 1990, Ser. No. 553,170

Claims priority, application Rep. of Korea, Jan. 29, 1990, 948/1990

Int. Cl.[5] H01L *21/263*

U.S. Cl. 437—41 **5 Claims**

1. A fabricating method for a CCD channel by self-alignment comprising the following steps of:

performing ion implantation in a selected active area of a semiconductor substrate;

depositing a first polysilicon layer on said active area;

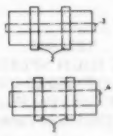
etching out a selected area of said first polysilicon layer to create a first polysilicon gate;

depositing a layer of PR having an opening overlying a portion of said first polysilicon gate;

performing a second ion implantation using said first polysilicon gate as a mask to provide self-alignment;

forming another PR layer having an opening larger than and overlying said first opening;

performing a third ion implantation using said first polysilicon gate as a mask to provide self-alignment;



depositing a second layer of polysilicon atop said selected active area; and

etching out a selected area of said second layer of polysilicon to provide a second polysilicon gate over a portion of said active area adjacent to said first polysilicon gate.

5,024,964

METHOD OF MAKING FERROELECTRIC MEMORY DEVICES

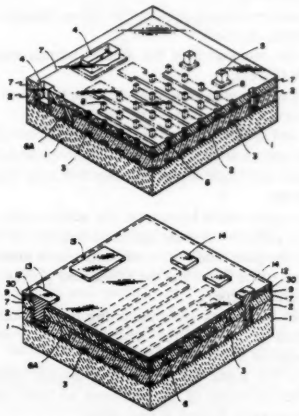
George A. Rohrer, Chassell, Mich., and Larry D. McMillin, Colorado Springs, Colo., assignors to Ramtron Corporation, Colorado Springs, Colo.

Division of Ser. No. 133,338, Mar. 24, 1980, Pat. No. 4,707,897, which is a continuation-in-part of Ser. No. 658,199, Feb. 17, 1976, Pat. No. 4,195,355, which is a continuation-in-part of Ser. No. 316,417, Dec. 18, 1972, Pat. No. 3,939,292, which is a continuation-in-part of Ser. No. 76,059, Sep. 28, 1970, Pat. No. 3,728,694. This application Oct. 31, 1985, Ser. No. 793,186

The portion of the term of this patent subsequent to Nov. 24, 2004, has been disclaimed.

Int. Cl.[5] H01L *21/90, 29/95*

U.S. Cl. 437—47 **24 Claims**



1. A method of fabricating a monolithic ferroelectric memory device coupled to an integrated circuit comprising the steps of:

forming first layer interconnects coupled to the integrated circuit;

depositing a non-semiconductor dielectric and forming interconnect and bonding pad vias therein;

depositing a conductive layer and forming a bottom electrode;

applying a ferroelectric layer;

depositing a conductive layer and forming a top electrode; and

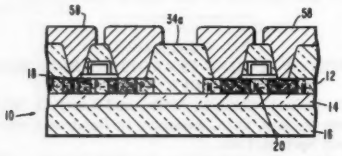
applying conductive material to the bonding and interconnect pads.

5,024,965

MANUFACTURING HIGH SPEED LOW LEAKAGE RADIATION HARDENED CMOS/SOI DEVICES

Chen-Chi P. Chang, 2515 Alta Vista Dr., Newport Beach, Calif. 92660, and Mei Li, 26572 Loma Verde, Mission Viejo, Calif. 92691

Filed Feb. 16, 1990, Ser. No. 481,148
Int. Cl.[5] H01L *21/336*
U.S. Cl. 437—57 20 Claims



13. A method of manufacturing low leakage, radiation hardened semiconductor devices, said method comprising the steps of:

providing a silicon on insulator substrate fabricated by means of a separation by ion implantation of oxygen process;

masking a substrate with a separation mask that defines silicon islands thereon;

etching the masked substrate to form the silicon islands;

oxidizing the silicon islands to form a relatively thin oxide layer thereover;

masking predetermined ones of the silicon islands and forming P-wells therein;

masking the remainder of the silicon islands and forming N-wells therein;

depositing a phosphoroborosilicate glass layer over the thin oxide layer and the surface of the substrate;

masking and etching the phosphoroborosilicate glass layer to form active areas, such that the phosphoroborosilicate glass and thin oxide layers are disposed over the edges of the islands;

disposing a gate oxide layer over the active areas;

fabricating polysilicon gates and interconnects that are coupled to the gate oxide layer of each active area;

forming an oxide layer on the fabricated polysilicon gates and interconnects;

forming an N+ mask and implanting dopant ions into the unmasked portions of the substrate to form source and drain regions in P-well active areas;

forming a P+ mask and implanting dopant ions into the unmasked portions of the substrate to form source and drain regions in N-well active areas;

depositing a second phosphoroborosilicate glass layer over the surface of the substrate;

heating the phosphoroborosilicate glass layers to a predetermined relatively low temperature to reflow the phosphoroborosilicate glass layers;

masking and etching the phosphoroborosilicate glass layers to form contact locations to source and drain regions of the active areas; and

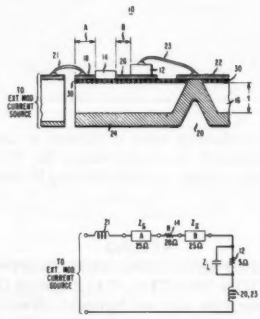
depositing conductive metalization over the surface of the wafer and etching conductive interconnects that contact the source and drain regions of the devices fabricated therein.

5,024,966

METHOD OF FORMING A SILICON-BASED SEMICONDUCTOR OPTICAL DEVICE MOUNT

Norman R. Dietrich, Allentown; Ralph S. Moyer, Cumru Township, Berks County, both of Pa., and Yiu-Huen Wong, Summit, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Division of Ser. No. 287,778, Dec. 21, 1988, Pat. No. 4,937,660. This application Apr. 16, 1990, Ser. No. 510,338
Int. Cl.[5] H01L *21/00*
U.S. Cl. 437—60 7 Claims



1. A method of forming a silicon-based stripline for providing an interconnection between a semiconductor optical device and a high frequency modulation signal source, said method comprising the steps of:

(a) providing a silicon substrate including first and second opposing major surfaces;

(b) depositing a thin film resistor on said first major surface of said substrate;

(c) forming a via through said silicon substrate at a spaced-apart location from said thin film resistor and;

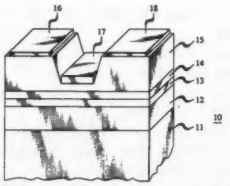
(d) metallizing longitudinal portions of said first and second major surfaces of said substrate, as well as the via, the first longitudinal portion being of a predetermined width w, the combination of said first and second metallized longitudinal portions with said substrate thus forming a stripline transmission path with a characteristic impedance Z_s, and the via being utilized to provide electrical connection between the second metallization and the semiconductor device.

5,024,967

DOPING PROCEDURES FOR SEMICONDUCTOR DEVICES

Rose F. Kopf, Bound Brook; J. M. Kuo, Edison; Henry S. Luftman, Fanwood, and Erdmann F. Schubert, New Providence, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 30, 1989, Ser. No. 374,336
Int. Cl.[5] H01L *21/20*
U.S. Cl. 437—95 17 Claims



1. A process for fabricating a semiconductor device com-

prising a semiconductor body with a doped region having a doping profile, which comprises the steps of

growing semiconductor material on a surface of a semiconductor body comprising a doped region with a doping profile, and

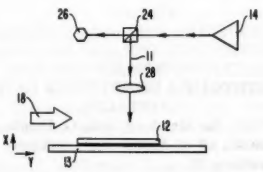
minimizing or eliminating segregation effects of surface electric fields, formed by Fermi-level pinning, on the dopants in the doped region, said minimizing or elimination being effected by illuminating the surface of the semiconductor body, on which growth is taking place, with radiation at least some of which has energy greater than the band gap of the semiconductor so as to create electron-hole pairs and shield the surface electric field from the dopants in the doped region.

5,024,968

REMOVAL OF SURFACE CONTAMINANTS BY IRRADIATION FROM A HIGH-ENERGY SOURCE

Audrey C. Engelsberg, 61-B Sherwood Forest, Wappingers Falls, N.Y. 12590

Filed Jul. 8, 1988, Ser. No. 216,903
Int. Cl.[5] H01L *21/268*
U.S. Cl. 437—173 **12 Claims**



1. A method for removing surface contaminants from the surface of a substrate while preserving the crystal structure of the surface being treated, comprising the steps of:

constantly flowing a gas across the substrate treatment surface, said gas being inert to the substrate treatment surface; and

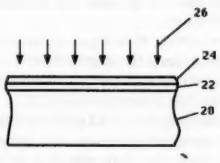
irradiating said substrate with high-energy irradiation, said irradiation characterized by an energy density and duration sufficient to release surface contaminants from the substrate treatment surface insufficient to alter the crystal structure of the substrate treatment surface.

5,024,969

HYBRID CIRCUIT STRUCTURE FABRICATION METHODS USING HIGH ENERGY ELECTRON BEAM CURING

John J. Reche, 8039 Agate, Ventura, Calif. 93004

Filed Feb. 23, 1990, Ser. No. 484,376
Int. Cl.[5] H01L *21/00, 21/02*; B05D *3/00, 3/02*
U.S. Cl. 437—173 **8 Claims**



1. A method of fabricating a high density multichip interconnect having interconnect circuitry over a first surface of a substrate, the high density multichip interconnect having at least one cured polymer insulator layer in the structure thereof formed over a partially fabricated high density multichip interconnect, the method including the following steps of forming the cured polymer insulator layer:

(a) coating the partially fabricated high density multichip interconnect with a layer of uncured polymer;

(b) curing the polymer layer of step (a) by bombarding the same with high energy electrons; and

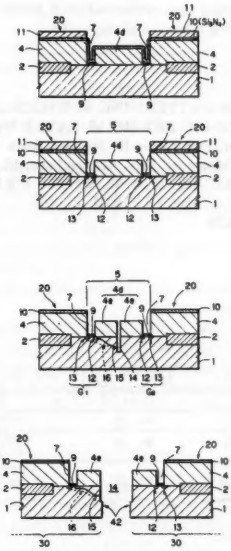
(c) wherein step (b) is performed at room temperature for approximately 1 to 120 seconds with the energy of the electrons in the region of 5 to 30 kilovolts.

5,024,970

METHOD OF OBTAINING SEMICONDUCTOR CHIPS

Masataka Mori, Fukuoka, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 5, 1989, Ser. No. 446,125
Claims priority, application Japan, Jun. 27, 1989, 1-164720
Int. Cl.[5] H01L *21/302*
U.S. Cl. 437—226 **9 Claims**



1. A method of obtaining semiconductor chips by cutting a semiconductor wafer in which a plurality of electronic element regions are provided, comprising the steps of:

(a) forming first and second electronic element regions on a major surface of said semiconductor wafer such that said first and second electronic element regions are isolated from each other across an isolating zone on said major surface, wherein said isolating zone extends in a first direction perpendicular to an alignment direction of said first and second electronic element regions;

(b) forming N grooves in said isolating zone parallel to said first direction, wherein (N−1) intergroove spaces intervene between said N grooves and N is an integer larger than one; and

(c) cutting said semiconductor wafer along a cutting line which is set on one of said (N−1) intergroove spaces and extends in said first direction to thereby obtain semiconductor chips each having an electronic element region;

wherein step (a) comprises the steps of:

(a−1) forming first and second active regions in said major surface, each of said first and second active regions having at least one electronic element; and

(a−2) providing first and second insulating layers which

cover said first and second active regions, respectively, to thereby obtain said first and second electronic element regions;

step (b) comprises the steps of:

(b−1) forming an insulating strip layer which extends in said first direction is a middle portion of said isolating zone, whereby a first gap is defined between said first insulating layer and said insulating strip layer, and a second gap is defined between said second insulating layer and said insulating strip layer; and

(b−2) forming first and second grooves in said isolating zone such that said first groove is aligned with a first side wall of said insulating strip layer facing said first insulating layer across said first gap, and said second groove is aligned with a second side wall of said insulating strip layer facing said second insulating layer across said second gap, and

step (c) comprises the steps of:

(c−1) setting said cutting line on said insulating strip layer; and

(C−2) cutting said semiconductor wafer at said cutting line with a mechanical dicing tool.

5,024,971

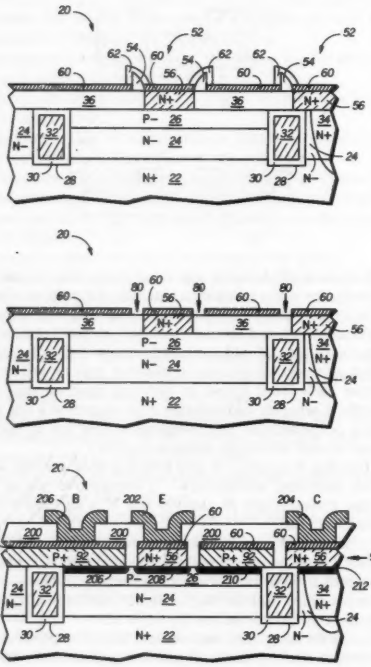
METHOD FOR PATTERNING SUBMICRON OPENINGS USING AN IMAGE REVERSAL LAYER OF MATERIAL

Frank K. Baker, and James D. Hayden, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 20, 1990, Ser. No. 570,180

Int. Cl.[5] H01L *21/465*

U.S. Cl. 437—228 **16 Claims**



1. A method for patterning a submicron opening within a first layer of material in a semiconductor device, comprising the steps of:

patterning a second layer of material overlying the first layer of material to define a window of a first dimension;

forming at least one sidewall spacer from a third layer of material along an edge of the window;

etching the second material while leaving the at least one sidewall spacer substantially intact;

depositing a fourth layer of material which selectively reacts with the second layer of material but not the at least one sidewall spacer to form a compound which functions as a hard mask;

removing unreacted portions of the fourth layer of material and the at least one sidewall spacer to expose a pedetermined portion of the first layer having a second dimension less than the first dimension, and

selectively etching the first layer where exposed with an etch process which uses the hard mask provided by the fourth layer to form the small opening in the first layer.

5,024,972

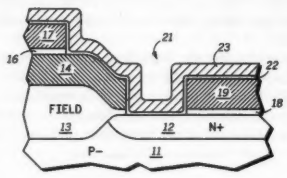
DEPOSITION OF A CONDUCTIVE LAYER FOR CONTACTS

Gary A. DePinto; Joe Steinberg; John G. Franka, and Michael R. Cherniawski, all of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 29, 1990, Ser. No. 471,451

Int. Cl.[5] H01L *21/469*

U.S. Cl. 437—233 **13 Claims**



1. A method for making a semiconductor device structure, comprising:

providing a semiconductor substrate having a surface with an exposed portion thereof;

placing the substrate in a furnace, said furnace having a wafer area for receiving a plurality of semiconductor substrates;

raising the temperature to all points within the wafer area to a first temperature range, said first temperature including a first temperature;

depositing a relatively thin layer of material for use as a conductor on at least the exposed portion of the the surface of the substrate while all points within the wafer area are within the first temperature range;

stabilizing the temperature to all points within the wafer area to a second temperature range, said second temperature range being narrower than said first temperature range, said second temperature range including the first temperature; and

depositing a relatively thick layer of material for use as a conductor on the relatively thin layer of conductive material while all points within the wafer area are within the second temperature range.

5,024,973

CRYSTALLIZED GLASS TOOTH CROWN MATERIAL

Kazuo Kondo, and Masahiko Okuyama, both of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Continuation of Ser. No. 719,103, Apr. 2, 1985, abandoned. This application Dec. 17, 1986, Ser. No. 943,828

Claims priority, application Japan, Apr. 2, 1984, 59-65531

Int. Cl.[5] C03C *10/02*

U.S. Cl. 501—10 7 Claims

1. A crystallized glass tooth crown consisting essentially of from 40 to 75 mol% component X, from 20 to 55 mol% component Y and from 0.1 to 10 mol% component Z, wherein

component X is P_2O_5,

component Y is selected from ZnO, K_2O, B_2O_3, and Al_2O_3 in an amount of up to 20 mol% and additionally CaO and BaO in an amount to bring the total mol% of component Y to up to 55 mol%, and

component Z is selected from SrO, Ta_2O_5, La_2O_3, CeO_2 and Nb_2O_5.

5,024,974

GLASS HAVING ULTRAFINE PARTICLES OF CUCL AND/OR CUBR PRECIPITATED THEREIN AND PROCESS FOR ITS PRODUCTION

Arao Nakamura, Nagoya; Tsuneo Manabe, Yokohama; Naoki Sugimoto, Yokohama, and Hiroshi Usui, Yokohama, all of Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Filed Mar. 22, 1990, Ser. No. 497,535

Claims priority, application Japan, Mar. 30, 1989, 1-76765; Sep. 19, 1989, 1-240581

Int. Cl.[5] C03C *3/11, 3/089, 3/091, 3/064*

U.S. Cl. 501—57 2 Claims

1. Glass having ultrafine particles of CuCl and/or CuBr precipitated therein, which consists essentially of:

from 10 to 70 mol % of SiO_2,

from 30 to 90 mol % of B_2O_3,

from 0.1 to 50 mol % of $Li_2O+Na_2O+K_2O$, and

from 0.01 to 10 mol % of CuCl+CuBr.

5,024,975

CRYSTALLIZABLE, LOW DIELECTRIC CONSTANT, LOW DIELECTRIC LOSS COMPOSITION

Hans S. Hartmann, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Co., Inc., Wilmington, Del.

Filed Oct. 19, 1989, Ser. No. 423,366

Int. Cl.[5] C03C *3/89, 3/91;* B32B *9/00*

U.S. Cl. 501—65 18 Claims

1. A composition for making low K, low dielectric loss dielectric layers, said composition comprising an admixture of finely divided solids comprising:

(a) 20–80% by weight, basis total solids, amorphous crystallizable glass;

(b) 20–60% by weight, basis total solids, amorphous borosilicate glass (1) in which the weight ratio of B_2O_3 to SiO_2 is 0.22–0.55, and (2) containing, basis total borosilicate glass, 0.2–1.0% by weight Al_2O_3, and 1.5–4.0% by weight of a mixture of oxides of alkali metals, alkaline earth metals or mixtures thereof, at least 0.5–1.2% by weight being Li_2O;

(c) 0.1 to 30% by weight, basis total solids, expansion control additive; and

(d) 0.05 to less than 1.0% by weight crystallization control additive.

5,024,976

ALUMINA-ZIRCONIA-SILICON CARBIDE-MAGNESIA CERAMIC CUTTING TOOLS

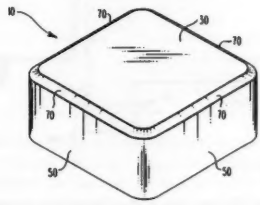
Pankaj K. Mehrotra, and Elizabeth R. Billman, both of Greensburg, Pa., assignors to Kennametal Inc., Latrobe, Pa.

Continuation of Ser. No. 266,959, Jan. 3, 1988, abandoned. This application Jul. 23, 1990, Ser. No. 560,484

The portion of the term of this patent subsequent to Sep. 25, 2007, has been disclaimed.

Int. Cl.[5] C04B *35/56*

U.S. Cl. 501—89 34 Claims



1. A metalcutting insert comprising:

a rake face;

a flank face;

a cutting edge at a juncture of said rake face and said flank face;

said cutting insert having an alumina based ceramic composition consisting essentially of:

about 1.5 to 32.5 v/o silicon carbide whiskers;

about 5 to 17.5 v/o zirconia;

a residue of a magnesia addition added in the amount of about 0.03 to 3 v/o;

alumina forming essentially the remainder of said composition;

wherein said silicon carbide whiskers, said zirconia and said residue of said magnesia addition are substantially homogeneously dispersed in a matrix formed of said alumina; and

wherein at least about 2.0 v/o of said ceramic composition is tetragonal zirconia.

5,024,977

COMBINATION OF TWO SLIDING OR SEALING ELEMENTS AND A METHOD FOR PRODUCING THE SAME

Kilian Friederich, Plochingen, and Dirk Rogowski, Bünzwangen, both of Fed. Rep. of Germany, assignors to Feldmuehle Aktiengesellschaft, Duesseldorf, Fed. Rep. of Germany

Filed Oct. 4, 1988, Ser. No. 253,125

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1987, 3733730

Int. Cl.[5] C04B *35/56*

U.S. Cl. 501—91 10 Claims

1. A combination of sliding or sealing elements with improved control of the bearing surface portion, said combination comprising at least one diphasic ceramic compact, sintered without pressure, in sliding or sealing contact with a countersurface, and containing silicon carbide, boron carbide, metal borides and optionally free carbon, where the sintered compact contains

44 to 89.5 wt.-% of α-silicon carbide

0.5 to 6 wt.-% of boron carbides, and

10 to 50 wt.-% of metal borides,

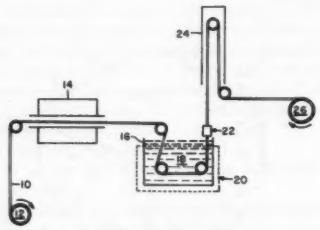
the metal borides being selected from groups 4b to 6b of the periodic system and form a second disperse phase in the sintered compact, and has a heightened metal boride content in the compact's functional surface in sliding or sealing engagement.

5,024,978

COMPOSITIONS AND METHODS FOR MAKING CERAMIC MATRIX COMPOSITES

Roger A. Allaire, Big Flats; Mark S. Friske; Sandra L. Hagg, both of Corning, and Victor F. Janas, Horseheads, all of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed May 30, 1989, Ser. No. 358,589
Int. Cl.[5] C04B *35/02, 35/08*
U.S. Cl. 501—95 14 Claims



1. A method for making a fiber-reinforced ceramic matrix composite comprising the step of combining inorganic reinforcing fibers with a liquid dispersion of a powder of a ceramic matrix material, wherein the liquid dispersion is a heated thermoplastic dispersion which is solid at room temperature.

5,024,979

METHOD OF FORMING A FIBROUS STRUCTURE COMPOSITE CERAMIC MATERIAL AND MATERIAL THUS OBTAINED

Caroline Debaig-Valade, Bordeaux; Claude Filliatre, Talence, and Christian Servens, St-Aubin de Medoc, all of France, assignors to Aerospatiale Societe Nationale Industrielle, Paris, France

Filed Mar. 22, 1989, Ser. No. 327,037
Claims priority, application France, Apr. 6, 1988, 8804546
Int. Cl.[5] C04B *35/80*
U.S. Cl. 501—95 16 Claims

14. A method for forming a composite ceramic material having a fibrous structure embedded in a ceramic matrix, comprising the steps of:

(a) impregnating said fibrous structure with a polymerization catalyst for polymerizing a polymerizable organometallic precursor of said ceramic matrix, said polymerizable catalyst selected from the group consisting of polyborodimethylsiloxane, polyborodiethylsiloxane, polyborodiphenylsiloxane, poyborodivinylsiloxane, trifluoromethanesulfonic acid, tribromomethanesulfonic acid, trifluoracetic acid and dodecacarbonyltriruthenium;

(b) placing said fibrous structure impregnated with said polymerization catalyst in contact with said polymerizable organometallic precursor selected from the group consisting of carbosilanes, silazanes, carbosilazanes, borazines, borazanes and aluminosilicate-silanes;

(c) polymerizing said organometallic precursor; and

(d) pyrolyzing said organometallic precursor so as to obtain said matrix.

5,024,980

CERAMIC DIELECTRIC ALLOY

Taki Negas, and Louis P. Dominques, both of Adamstown, Md., assignors to Alpha Industries, Woburn, Mass.

Filed May 15, 1987, Ser. No. 49,985
Int. Cl.[5] C04B *35/46*
U.S. Cl. 501—134 2 Claims

1. A method of fine-tuning the dielectric constant value of an insulating sinterd ceramic alloy, said method comprising making an insulating, sintered ceramic alloy from 10 to 90 mol % of magnesium titanate and 90 to 10 mol % of magnesium aluminate, or from corresponding amounts of magnesium oxide or oxide precursor, titanium oxide or oxide precursor, and aluminum oxide or oxide precursor, and varying the mol ratio of the titanate to the aluminum, or of the corresponding metal oxides or oxide precursors, in order to vary the value of the dielectric constant of the alloy.

5,024,981

STAGED METAL-PROMOTED ZEOLITE CATALYSTS AND METHOD FOR CATALYTIC REDUCTION OF NITROGEN OXIDES USING THE SAME

Barry K. Speronello, Belle Mead; John W. Byrne, and James M. Chen, both of Edison, all of N.J., assignors to Engelhard Corporation, Iselin, N.J.

Filed Apr. 20, 1989, Ser. No. 340,992
Int. Cl.[5] B01J *29/06*
U.S. Cl. 502—67 8 Claims

1. A catalyst composition effective for reducing nitrogen oxides with ammonia in a gaseous stream, the composition having a first catalyst and a second catalyst as sensed relative to the sequence of flow of the gaseous stream through the composition, the composition comprising:

(a) a first catalyst comprising a first zeolite and optionally including not more than about 1 percent by weight of a promoter selected from the group consisting of one or both of iron and copper, calculated as the metal and based on the weight of metal plus the first zeolite; and

(b) a second catalyst comprising a second zeolite including more than about 1% by weight of a promoter selected from the group consisting of iron and copper, calculated as the metal and based on the weight of metal plus the second zeolite.

5,024,982

SILICA-CONTAINING OLEFIN POLYMERIZATION CATALYSTS AND PROCESS

Gil P. Hawley, Dewey, and Max P. McDaniel, Bartlesville, both of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 14, 1988, Ser. No. 284,280
Int. Cl.[5] C08F *4/64*
U.S. Cl. 502—110 19 Claims

1. A method for the preparation of a crystalline olefin polymerization catalyst component which comprises:

(a) contacting a magnesium dihalide with at least one transition metal compound in the presence of a diluent under conditions suitable for the formation of a soluble complex;

(b) contacting said soluble complex produced in accordance with step (a) with about 0.1 to about 20 wt. percent based on said soluble complex of a particulate material consisting essentially of silica to produce a solid;

(c) contacting said solid with about 0.1 to about 10 mole per mole transition metal compound of an organoaluminum halide to produce said catalyst component.

3. A method in accordance with claim 1 wherein said step a) further comprises the addition of an electron donor or mixture of electron donors selected from the group consisting of phenols and aromatic esters, wherein the molar ratio of said electron donor or mixture to said magnesium dihalide is in the range of 5:1 to 1:5.

10. A method in accordance with claim 3 wherein said crystalline olefin polymerization catalyst component is further contacted with a cocatalyst comprising an organoaluminum compound, wherein the molar ratio of cocatalyst to transition metal compound of said first catalyst component is in the range of 1:1 to 1500:1.

5,024,983

CATALYST SYSTEM, PROCESS FOR ITS PREPARATION AND ITS APPLICATION TO THE MANUFACTURE OF ALDEHYDES

Eric Paumard, Cappel; Sylvain Mutez, Tourcoing; André Mortreux, Hem, and Francis Petit, Villeneuve D'Ascq, all of France, assignors to Norsolor, Paris, France

Filed Mar. 15, 1989, Ser. No. 323,718

Claims priority, application France, Mar. 30, 1988, 88 04192

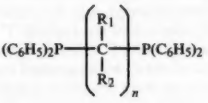
Int. Cl.[5] B01J *31/22, 31/24*

U.S. Cl. 502—167 12 Claims

1. Catalyst system comprising:

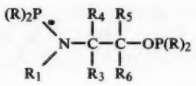
at least one platinum complex of formula $LPtX_2$ in which L is an organic compound containing at least two phosphorus atoms capable of coordinating platinum selected from (a) a bis(diphenylphosphino)-alkane of the formula

(I)



in which R_1 and R_2, which are identical or different, are chosen from the hydrogen atom and aliphatic hydrocarbon radicals, and n is greater than or equal to 4 and (b) an aminophosphinephosphinite of the formula

(II)



in which:

R is an aliphatic, cycloaliphatic or aromatic hydrocarbon radical,

R_1 is chosen from the hydrogen atom and hydrocarbon radicals,

R_3 and R_4 which necessarily differ from each other, are chosen from the hydrogen atom and hydrocarbon radicals optionally carrying at least one functional group chosen from alcohol, thiol, thioether, amine, imine, acid, ester, amide and ether functional groups,

R_5 and R_6 are chosen from the hydrogen atom and hydrocarbon radicals, and

R_1, R_3 and the nitrogen and carbon atoms which carry them respectively may together form a heterocyclic ring; and X is a halogen atom, and

at least one combination formed between iron and an alkene carbonate by electrochemical reduction.

5,024,984

CATALYSTS FOR THE OXIDATIVE CONVERSION OF METHANE TO HIGHER HYDROCARBONS

Mark P. Kaminsky, Lisle; Mark S. Kleefisch, Plainfield; George A. Huff, Naperville; Don M. Washecheck, Naperville; Aileen E. Alvarado-Swaisgood, Naperville, and Mark K. Barr, Wheaton, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

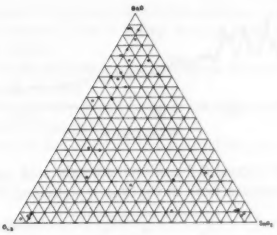
Continuation-in-part of Ser. No. 233,063, Aug. 17, 1988. This application Jul. 19, 1989, Ser. No. 382,479

Int. Cl.[5] B01J *23/02*

U.S. Cl. 502—303 13 Claims

1. An oxidative coupling catalyst composition for converting methane to a higher hydrocarbon comprising a mixed oxide of: a) a Group IIIB metal selected from the group consisting of yttrium, lanthanum and scandium; b) a Group IIA metal selected from the group consisting of barium, calcium and strontium; and c) a Group IVA metal selected from the group consisting of tin, lead and germanium and wherein the cationic species of the Group IIIB metals, the Group IIA metals and the Group IVA metals are present in the approximate ratio of 1:0.5–3:2–4, respectively.

8. A process for preparing a catalyst represented by the approximate empirical formula $Y_1Ba_2Sn_3O_y$ wherein the value of y represents the number of oxygen anions required to bal-



ance the combined charge of the cationic species Y, Ba and Sn, comprising intimately mixing an oxygen-containing compound of each of yttrium, barium and tin, and thereafter calcining said mixture at a temperature of up to about 1000° C. to produce said catalyst.

5,024,985

SUPPORT MATERIAL FOR THREE-WAY CATALYSTS CONTAINING PLATINUM GROUP METAL AND HAVING REDUCED TENDENCY FOR H_2S EMISSION

Edgar Koberstein, Alzenau; Bernd Engler, Hanau; Rainer Domesle, Alzenau-Kälberau, and Peter Schubert, Hanau, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 29, 1990, Ser. No. 471,486

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1989, 3902913

Int. Cl.[5] B01J *21/04, 23/10, 23/40*

U.S. Cl. 502—304 17 Claims

1. A support material for a three-way catalyst containing platinum group metal for the purification of exhaust gases of an internal combustion engine having reduced tendency for H_2S emission, comprising a mixture of active aluminum oxide and at least 10 wt.% of cerium oxide as the support or cerium oxide alone as the support, relative to the sum of all support constituents, produced by spray-drying an aqueous suspension of 0–90 parts by weight of an active, aluminum oxide and/or its particular precursor, and 10–100 parts by weight of cerium oxide or of a soluble and/or insoluble precursor of the cerium oxide, calculated as CeO_2, and by annealing the material thus obtained for 15 minutes to 24 hours at 350°–1,140° C.

5,024,986

HEAT SENSITIVE RECORDING PAPER

Toru Katsura; Hiroo Kaji, both of Tokyo; Kenji Hyodo, Tsuchiura, and Hirokazu Ohkura, Tokyo, all of Japan, assignors to Mitsubishi Paper Mills Limited, Tokyo, Japan

Filed May 26, 1989, Ser. No. 357,190

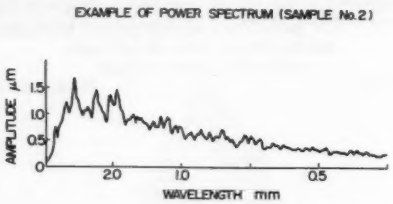
Claims priority, application Japan, May 27, 1988, 63-131274

Int. Cl.[5] B41M *5/40*

U.S. Cl. 503—200 4 Claims

1. Heat sensitive recording paper comprising a heat sensitive recording layer which, upon heating, develops color, wherein

the average amplitude of paper thickness variation in the range of 0.2-mm and 1.0-mm wavelengths of paper thickness variation does not exceed 0.5 μm and wherein said paper has no distinctive variation peak in the above wavelength range.



5,024,987

RECORDING MATERIAL

Günter Klug, Monheim; Gert Jabs, Odenthal; Horst Berneth, Leverkusen, and Artur Botta, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 17, 1989, Ser. No. 438,921

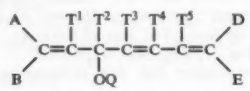
Claims priority, application Fed. Rep. of Germany, Dec. 7, 1988, 3841184

Int. Cl.[5] B41M *5/136*

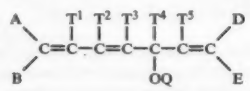
U.S. Cl. 503—211 **20 Claims**

1. Pressure-sensitive reactive recording material containing color-forming agents and color developers as characteristic constituents, characterized in that

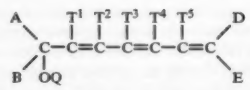
a) the dyestuff-forming agent is a tetraindolylheptamethine of the formula I/1, I/2, I/3 or I/4.



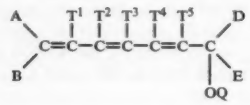
I/1



I/2

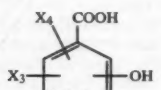


I/3



I/4

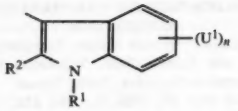
b) and the color developer is the salt of a polyvalent metal and an aromatic carboxylic acid having at least 10 carbon atoms, of the formula (II)



(II)

wherein, in the abovementioned formulae,

A, B, D and E denote



and can be identical to or different from one another,

Q denotes hydrogen, alkyl, alkenyl, cycloalkyl, aralkyl, aryl or a heterocyclic radical which is bonded via alkyl,

R^1 denotes hydrogen, alkyl, alkenyl, cycloalkyl, aralkyl or a heterocyclic radical which is bonded via alkyl,

R^2 denotes hydrogen, alkyl, alkenyl, cycloalkyl, aralkyl aryl or a heterocyclic radical,

T^1 to T^5 denotte hydrogen, alkyl, alkenyl, cycloalkyl, aralkyl, halogen, alkoxy, dialkylamino, cyano, hydroxycarbonyl, alkoxycarbonyl, aryl or a heterocyclic radical, or in each case two of the radicals T^1 to T^5 denote the missing members of a 5- or 7-membered ring, which can be aromatic or partly hydrogenated and can contain up to 2 heteroatoms from the series comprising O, N or S,

U^1 denotes hydrogen, alkyl, alkenyl, cycloalkyl, aralkyl, aryl, hydroxyl, alkoxy, halogen, dialkylamino, nitro, cyano, alkylthio, alkoxycarbonyl, dialkylaminocarbonyl, alkoxycarbonyloxy or alkylsulphonyl, or, together with R^1, denote a C_2-or C_3-bridge,

denotes 1 or 2,

X_1, X_3 and X_4 denote hydrogen, halogen, hydroxyl, alkyl, cycloalkyl, aryl, alkaryl, aralkyl, alkoxy or aryloxy, or two adjacent radicals X_1, X_2, X_3 and X_4 together can form a ring,

and wherein all of the cyclic and non-cyclic radicals can carry nonionic substituents.

5,024,988

PRESSURE-OR HEAT-SENSITIVE RECORDING MATERIAL

Rudolf Zink, Alemannenstrasse, and Rox Phaff, Gstaadmattstrasse, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 28, 1989, Ser. No. 442,087

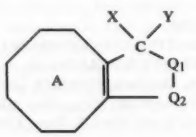
Claims priority, application Switzerland, Dec. 2, 1988, 4484/88; Jul. 6, 1989, 2510/89

Int. Cl.[5] B41M *5/16, 5/18, 5/22*

U.S. Cl. 503—212 **32 Claims**

1. A pressure-sensitive or heat-sensitive recording material comprising a substrate and a color reactant system in which the color reactant system comprises

(A) a polycyclic compound of the formula



(I)

in which

X is a monocyclic or polycyclic aromatic or heteroaromatic radical,

Y is a substituent detachable as an anion,

Q_1 is —O—, —S—, >N—R or >N—NH—R,

Q_2 is —CH_2—, —CO—, —CS— or —SO_2—,

R is hydrogen, C_1–C_{12}alkyl, C_5–C_{10}cycloalkyl, aryl or aralkyl, and ring A is an aromatic or heterocyclic radical having 6 ring atoms, which can have an aromatic fused ring, it being possible for both ring A and the fused ring to be substituted,

(B) an organic condensation component and

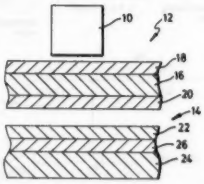
(C) a colour-developing component.

5,024,989

PROCESS AND MATERIALS FOR THERMAL IMAGING

Yunn H. Chiang, Andover, Mass., and Russell A. Gaudiana, Merrimack, N.H., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 25, 1990, Ser. No. 514,169
Int. Cl.[5] B41M *5/035, 5/26*
U.S. Cl. 503—227 **32 Claims**



1. A process for thermal imaging using a donor sheet and a receiving sheet, the donor sheet comprising a support and a dye capable of being transferred by heat, the receiving sheet comprising a support and being adapted to receive the dye and thereby form an image, the process comprising placing the donor and receiving sheets adjacent one another, a polymeric liquid crystal being provided on at least one of the donor and receiving sheets so as to be present at the interface between the donor and receiving sheets, and heating selected portions of the donor sheet so as to transfer dye from the donor sheet to the receiving sheet, thereby forming an image on the receiving sheet.

5,024,990

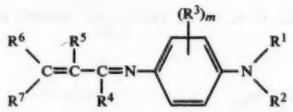
MIXTURE OF DYES FOR CYAN DYE DONOR FOR THERMAL COLOR PROOFING

Derek D. Chapman, and Steven Evans, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 31, 1990, Ser. No. 606,395
Int. Cl.[5] B41M *5/035, 5/26*
U.S. Cl. 503—227 **20 Claims**

13. In a process of forming a dye transfer image comprising imagewise-heating a cyan dye-donor element comprising a support having thereon a dye layer comprising a mixture of cyan dyes dispersed in a polymeric binder, at least one of the cyan dyes having the formula:

I



wherein:

R^1 and R^2 each independently represents hydrogen; a substituted or unsubstituted alkyl group having from 1 to about 6 carbon atoms; a substituted or unsubstituted cycloalkyl group having from about 5 to about 7 carbon atoms or a substituted or unsubstituted allyl group;

or R^1 and R^2 can be joined together to form, along with the nitrogen to which they are attached, a 5- to 7-membered heterocyclic ring;

or either or both of R^1 and R^2 can be combined with R^3 to form a 5- to 7-membered heterocyclic ring;

each R^3 independently represents substituted or unsubstituted alkyl, cycloalkyl or allyl as described above for R^1 and R^2, alkoxy, aryloxy, halogen, thiocyano, acylamido, ureido, alkylsulfonamido, arylsulfonamido, alkylthio, arylthio or trifluoromethyl;

or any two of R^3 may be combined together to form a 5- or 6-membered carbocyclic or heterocyclic ring;

or one or two of R^3 may be combined with either or both of R^1 and R^2 to complete a 5- to 7-membered ring;

m is an integer of from 0 to 4;

R^4 represents an electron withdrawing group;

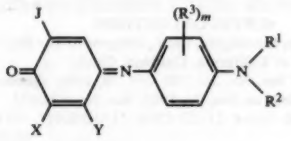
R^5 represents a substituted or unsubstituted aryl group having from about 6 to about 10 carbon atoms or a substituted or unsubstituted hetaryl group having from about 5 to about 10 atoms;

R^6 and R^7 each independently represents an electron withdrawing group; and

R^6 and R^7 may be combined to form the residue of an active methylene compound;

and at least one of the other of the dyes having the formula:

II



wherein:

R^1, R^2, R^3 and m represent the same as above;

X represents hydrogen, halogen or may be combined together with Y to represent the atoms necessary to complete a 6-membered aromatic ring; with the proviso that when X is hydrogen, then J represents $NHCOR_F$, where R_F represents a perfluorinated alkyl or aryl group; and with the further proviso that when X is halogen, then J represents $NHCOR^8$, $NHCO_2R^8$, $NHCONHR^8$ or $NHSO_2R^8$; and with the further proviso that when X is combined with Y, then J represents $CONHR^8$, SO_2NHR^8, CN, SO_2R^8 or SCN, in which case, however, R^8 cannot be hydrogen;

R^8 is the same as R^1 and R^5 as described above; and

Y is R^1, R^5, acylamino or may be combined together with X as described above.

5,024,991

COMPOSITION USING SCHIFF BASE COPPER COMPLEX FOR PREPARING COMPOUND METAL OXIDES

Makoto Tsunashima, Tokyo; Hiroto Uchida, Omiya; Kazuhiro Sakai, Omiya, and Masato Miyauchi, Omiya, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 1, 1988, Ser. No. 226,999
Claims priority, application Japan, Jul. 31, 1987, 62-190203; Jul. 31, 1987, 62-190205; Sep. 1, 1987, 62-216514; Jan. 29, 1988, 63-17305
Int. Cl.[5] C01G *3/00;* **C04B** *35/00;* **C23C** *18/12;* **H01L** *39/12*
U.S. Cl. 505—1 **4 Claims**

1. A composition for preparing a compound oxide of a rare earth metal, an alkaline earth metal and copper in a specific content ratio which comprises:

(1) an alkoxide of a rare earth metal,

(2) an alkoxide of an alkaline earth metal, and

(3) a Schiff base chelate complex of copper,

in such content ratio that the amount of the rare earth metal in said alkoxide, the amount of the alkaline earth metal in said alkoxide and the amount of copper in said complex correspond to the amounts of these metals in the object compound metal oxide.

3. A film-forming composition for forming a thin film of the compound metal oxide comprising

(1) an alkoxide of a rare earth metal,

(2) an alkoxide of an alkaline earth metal, and

(3) a Schiff base chelate complex of copper,

in such content ratio that the amount of the rare earth metal in

said alkoxide, the amount of the alkaline earth metal in said alkoxide and the amount of copper in said complex correspond to the amounts of these metals in the object compound metal oxide,

(4) a film-forming resin, and

(5) an organic solvent.

5,024,992

PREPARATION OF HIGHLY OXIDIZED $RBA_2CU_4O_8$ SUPERCONDUCTORS

Donald E. Morris, Kensington, Calif., assignor to The Regents of the University of California, Oakland, Calif.

Continuation of Ser. No. 263,750, Oct. 28, 1988, abandoned. This application Jun. 22, 1990, Ser. No. 542,672

Int. Cl.[5] **C01B** *13/14, 13/32;* **C01F** *11/02;* **H01L** *39/12*

U.S. Cl. 505—1 **14 Claims**

1. A process for producing a superconducting material, said process comprising:

(a) forming a composition by admixing (i) a compound of a metal selected from the group consisting of yttrium and rare earth metals with (ii) a compound of barium and (iii) a compound of copper, said compounds selected from the group consisting of oxides, nitrates and carbonates thereof, in relative amounts such that the atomic ratio of said metal to barium to copper in said composition is approximately 1:2:4;

(b) heating said composition in an oxygen-containing atmosphere having an oxidizing potential greater than 50% molecular oxygen at a pressure of at least 30 atmospheres to a temperature and for a length of time sufficient to effect interdiffusion of said compounds and the formation of a substantially single phase crystalline or polycrystalline lattice structure having approximately the empirical formula $RBa_2Cu_4O_8$ where R is said metal of compound (i), which lattice structure is temperature stable at temperatures below about 750° C.

5,024,993

SUPERCONDUCTING-SEMICONDUCTING CIRCUITS, DEVICES AND SYSTEMS

Harry Kroger, and Uttam S. Ghoshal, both of Austin, assignors to Microelectronics & Computer Technology Corporation, Austin, Tex.

Filed May 2, 1990, Ser. No. 518,004

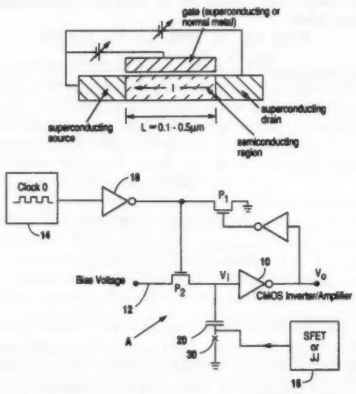
Int. Cl.[5] **H01L** *27/00, 39/00;* **G06F** *7/00;* **H05G** *1/66*

U.S. Cl. 505—1 **20 Claims**

1. A superconducting-semiconducting electrical circuit element comprising:

(a) a superconducting charge controlled three-terminal device, having a device control terminal, a second terminal and a third terminal, wherein the output current between the second and third terminals is controlled by the voltage applied to the control terminal, and wherein the output current exhibits superconducting characteristics as a function of temperature and input charge conditions; and

(b) a cryogenic semiconducting interconnect circuit, adapted to receive as an input an output signal from said superconducting device, and to provide a semiconductor



switching voltage level output signal modulated by the input signal from said superconducting device.

5,024,994

RENIN INHIBITORS IV

Annette M. Doherty, Ann Arbor, Mich.; James P. Hudspeth, Newbury Park, Calif.; James S. Kaltenbronn, Ann Arbor; Joseph T. Repine, Ann Arbor, Mich.; William H. Roark, Ann Arbor, Mich.; Ila Sircar, Ann Arbor, Mich., and Francis J. Tinney, Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 113,278, Nov. 12, 1987, abandoned, which is a continuation-in-part of Ser. No. 945,582, Dec. 23, 1986, abandoned. This application Aug. 17, 1988, Ser. No. 233,320

Int. Cl.[5] **A61K** *37/02;* **C07K** *5/00*

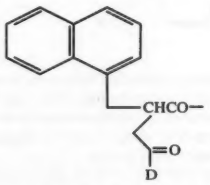
U.S. Cl. 514—18 **6 Claims**

1. A peptide of the formula

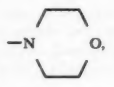
ACYL—X—Y—W—U—V (I)

or a pharmaceutically acceptable acid addition salt thereof, wherein

ACYL is BOC, IVA, NVA, DNMA, Z, MNPP, BMA, BBSP, or



wherein D is



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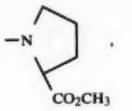
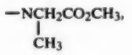
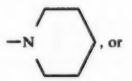
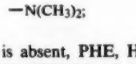
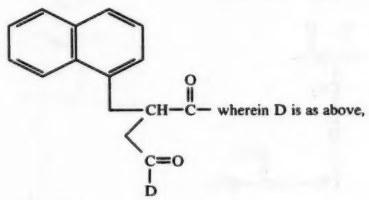








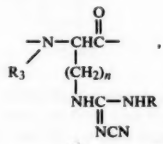
X is absent, PHE, HOMOPHE, NAPHTHYLALA, CYCLOHEXYLALA, O-MeTYR, TYR, or TRP, with the proviso that when ACYL is DNMA, BBSP, MNPP, or

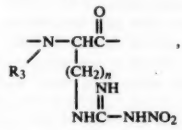


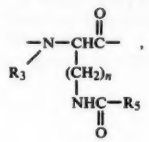
wherein D is as above,

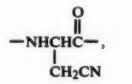
X is absent;

Y is









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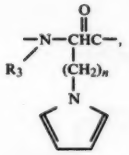

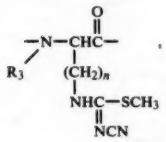

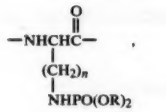

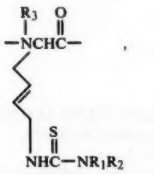

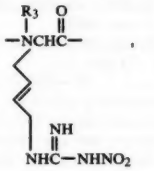

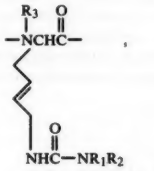

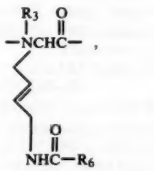

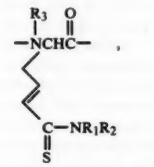

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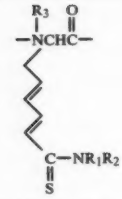

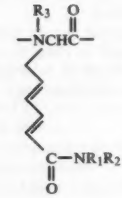

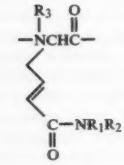

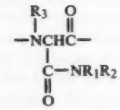

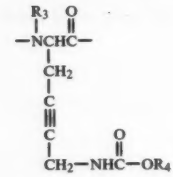

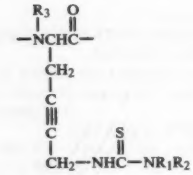

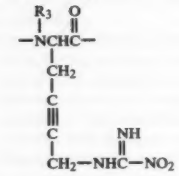

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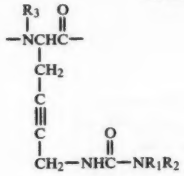

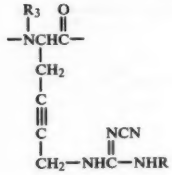

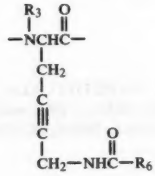

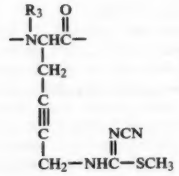

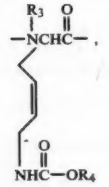

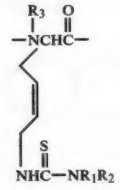

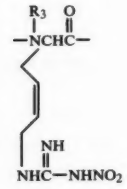

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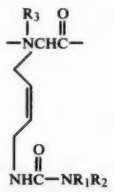
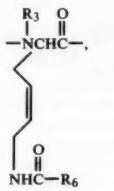
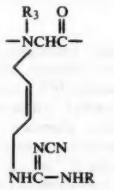
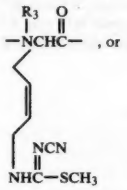
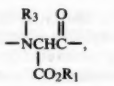










wherein n is an integer from 2 to 8, R is hydrogen or an alkyl of from 1 to 3 carbon atoms,

R_1 and R_2 are each independently hydrogen, lower alkyl of from 1 to 4 carbon atoms, or taken together form a 5 or 6 membered ring with the nitrogen to which they are attached, aralkyl, or aryl,

R_3 is hydrogen or methyl,

R_4 is lower alkyl or benzyl,

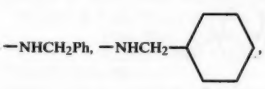
R_5 is CH_2SCH_3, CH_2SOCH_3, or $CH_2SO_2CH_3$,

R_6 is R_5, H, or lower alkyl;

W is STA, PHSTA, CYSTA, ASTA, ACYS, CHSTA, DFSTA, DFKSTA, DFCYS, DFKCYS, DFCHS, or DFKCHS;

U is absent, LEU, ILE, VAL, N-MeLEU, N-MeILE; and

V is



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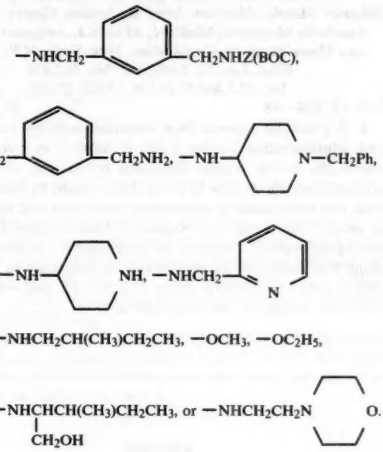


5,024,995

NATURAL PULMONARY SURFACTANT, METHOD OF PREPARATION AND PHARAMCEUTICAL COMPOSITIONS

Bengt Robertson, and Tore Curstedt, both of Stockholm, Sweden, assignors to Chiesi Farmaceutici S.P.A., Perma, Italy

Filed Apr. 5, 1988, Ser. No. 177,771

Claims priority, application Italy, Apr. 8, 1987, 20032 A/87

Int. Cl.[5] A61K *37/22, 31/685*

U.S. Cl. 514—21 **4 Claims**

1. An animal pulmonary surfactant which consists of polar lipids and proteins wherein the polar lipids are mainly phospholipids and the proteins are hydrophobic low molecular weight proteins of 3–14 KD (Kilodaltons), the polar lipid content is 98.5–99%, the protein content is less than 1.5%, and the phospholipid fraction contains at least 70–75% by weight of phosphatidylcholine, 40–45% of which consists of diplamitoylphosphatidylcholine, said surfactant is free of carbohydrates, cholesterol, triglycerides and cholesterol esters.

5,024,996

R-T-E CEREAL WITH SOLUBLE FIBERS

Mitchell L. Ringe, Maple Grove, Minn., assignor to General Mills, Inc., Minneapolis, Minn.

Filed Dec. 5, 1989, Ser. No. 446,247

Int. Cl.[5] A23L *1/42, 1/29;* **A21D** *8/00, 13/00*

U.S. Cl. 514—54 **29 Claims**

1. A ready-to-eat R-T-E cereal which is high in total dietary fiber, comprising a cereal composition including:

A. about 20% to 80% by weight of the cereal composition of a starchy cereal ingredient;

B. about 10% to 70% by weight of the cereal composition of a barley flour extract having glucan content of about 18% to 50% by weight;

C. sufficient amounts of an insoluble fiber source so as to provide the cereal composition with a weight ratio of soluble fiber to insoluble fiber of about 1 to 5:1;

D. a moisture content of about 1% to 6% by weight of the cereal composition; and

wherein the minimum soluble fiber content is about 10% by weight of the cereal composition.

5,024,997

PALATABLE IBUPROFEN SOLUTIONS

Solomon Motola, Marlton; Gary R. Agisim, Cherry Hill, and Annabelle Mogavero, Medford, all of N.J., assignors to American Home Products Corporation, New York, N.Y.

Filed Jun. 22, 1990, Ser. No. 542,453

Int. Cl.[5] A01N *43/04, 37/10, 25/00*

U.S. Cl. 514—58 5 Claims

1. A palatable aqueous base ibuprofen solution suitable for oral administration having a pH of about 3 to 5 comprising about 2% to 5% weight ibuprofen by volume of the total composition, about 20% to about 70% weight by volume of at least one taste masking sweetening ingredient and about 22% to about 75% weight by volume of hydroxypropyl beta cyclodextrin having a degree of hydroxpropyl substitution of about 6 to about 7.5, the weight ratio of ibuprofen to hydroxypropyl beta cyclodextrin being 1:11 to 1:15, and water qs to 100% by volume of the composition.

5,024,998

PHARMACEUTICAL FORMULATIONS FOR PARENTERAL USE

Nicholas S. Bodor, Gainesville, Fla., assignor to University of Florida, Gainesville, Fla.

Continuation-in-part of Ser. No. 139,755, Dec. 30, 1987, and a continuation-in-part of Ser. No. 174,945, Mar. 29, 1988, and a continuation-in-part of Ser. No. 431,222, Nov. 3, 1989, which is a continuation-in-part of Ser. No. 139,755, and a continuation-in-part of Ser. No. 174,945, which is a continuation-in-part of Ser. No. 139,755. This application Dec. 11, 1989, Ser. No. 448,655

Claims priority, application Canada, Dec. 13, 1988, 585791; Ireland, Dec. 13, 1988, 3717/88; Mar. 14, 1989, 810/89

The portion of the term of this patent subsequent to Jan. 8, 2008, has been disclaimed.

Int. Cl.[5] C08B *37/16;* A61K *31/735*

U.S. Cl. 514—58 86 Claims

1. A method for decreasing the incidence of precipitation of a lipophilic and/or water-labile drug occurring at or near the injection site and/or in the lungs or other organs following parenteral administration, said method comprising parenterally administering said drug in an aqueous solution containing from about 20% to about 50% cyclodextrin selected from the group consisting of hydroxyethyl, glucosyl, maltosyl and maltotriosyl derivatives of β-cyclodextrin and hydroxypropyl, hydroxyethyl, glucosyl, maltosyl and maltotriosyl derivatives of γ-cyclodextrin.

5,024,999

PYRAZOLOPYRIDINE TYPE MEVALONOLACTONES USEFUL AS PHARMACEUTICALS

Yoshihiro Fujikawa; Mikio Suzuki; Hiroshi Iwasaki, all of Funabashi; Mitsuaki Sakashita, and Masaki Kirahara, both of Shiroaoka, all of Japan, assignors to Nissan Chemical Industries Ltd., Tokyo, Japan

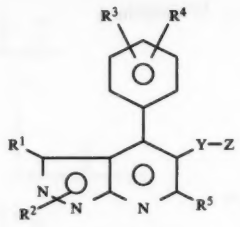
Filed Apr. 13, 1989, Ser. No. 337,411

Claims priority, application Japan, Apr. 26, 1988, 63-103090; Oct. 27, 1988, 63-271439; Jan. 26, 1989, 1-16846; Apr. 7, 1989, 1-88534

Int. Cl.[5] A61K *31/435;* C07D *471/04*

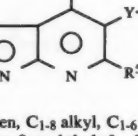
U.S. Cl. 514—63 22 Claims

1. A compound of the formula:

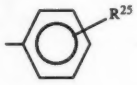


(I)

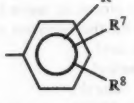
wherein R^2 is hydrogen, C_{1-8} alkyl, C_{1-6} alkoxy, C_{3-7} cycloalkyl, C_{2-6} alkenyl, α-or β-naphthyl, 2-, 3- or 4-pyridyl, 2- or 3-thienyl, 2- or 3-furyl, fluoro, chloro, bromo,



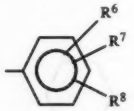
(wherein R^6, R^7 and R^8 are independently hydrogen, C_{1-8} alkyl, C_{1-8} alkoxy, C_{1-3} alkylthio, chloro, bromo, fluoro, $—NR^9R^{10}$ (wherein R^9 and R^{10} are independently C_{1-3} alkyl), chloromethyl, trichloromethyl, trifluoromethyl, trifluoromethoxy, trichloromethoxy, difluoromethoxy, phenoxy, benzyloxy, hydroxy, trimethylsilyloxy, diphenyl-t-butylsilyloxy, hydroxymethyl or $—O(CH_2)_kOR^{18}$ (wherein R^{18} is hydrogen or C_{1-3} alkyl, and k is 1, 2 or 3); when R^8 is hydrogen and when located at the ortho position to each other, R^6 and R^7 may together form $—OC(R^{19})(R^{20})O—$ wherein R^{19} and R^{20} are independently hydrogen or C_{1-3} alkyl); or when R^7 and R^8 are hydrogen at the same time, R^6 is



(wherein R^{25} is hydrogen, C_{1-4} alkyl, C_{1-3} alkoxy, trifluoromethyl, chloro, bromo, or fluoro)), phenyl-C_{2-3} alkenyl of which the phenyl group is unsubstituted or substituted by C_{1-4} alkyl, C_{1-3} alkoxy, fluorine, chlorine or bromine, or C_{1-3} alkyl substituted by one member selected from the group consisting of C_{1-3} alkoxy, naphthyl and

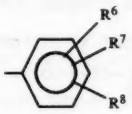


(wherein R^6, R^7 and R^8 are as defined above); R^2 is bonded to nitrogen at the 1- or 2-position of the pyrazolopyridine ring and is hydrogen, C_{1-8} alkyl, C_{1-3} alkyl substituted by 1 to 3 fluorine, C_{3-7} cycloalkyl, α- or β-naphthyl, 2-, 3- or 4-pyridyl, 2- or 3-thienyl, 2- or 3-furyl or

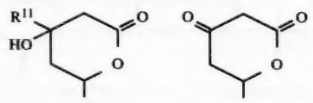


(wherein R^6, R^7 and R^8 are as defined above), or C_{1-3} alkyl

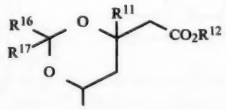
substituted by one member selected from the group consisting of C_{1-3} alkoxy, hydroxy, naphthyl and



(wherein R^6, R^7 and R^8 are as defined above) R^3 and R^4 are independently hydrogen, C_{1-8} alkyl, C_{3-7} cycloalkyl, C_{1-3} alkoxy, n-butoxy, i-butoxy, sec-butoxy, $R^{23}R^{24}N$— (wherein R^{23} and R^{24} are independently hydrogen or C_{1-3} alkyl), trifluoromethyl, trifluoromethoxy, difluoromethoxy, fluoro, chloro, bromo, phenyl, phenoxy, benzyloxy, hydroxy, trimethylsilyloxy, diphenyl-t-butylsilyloxy, hydroxymethyl or $—O(CH_2)_lOR^{15}$ (wherein R^{15} is hydrogen or C_{1-3} alkyl, and l is 1, 2 or 3); or when located at the ortho position to each other, R^3 and R^4 may together form —CH=CH—CH=CH— or methylene dioxy; Y is $—CH_2—$, $—CH_2CH_2—$, —CH=CH—, $—CH_2—CH=CH—$, —CH=CH—CH_2—, $—C(CH_3)=$ CH— or $—CH=C(CH_3)$; Z is $—Q—CH_2WCH_2—CO_2R^{12}$,



or



(wherein Q is —C(O)—, $—C(OR^{13})_2—$ or —CH(OH)—; W is —C(O)—, $—C(OR^{13})_2—$ or $—C(R^{11})(OH)—$; R^{11} is hydrogen or C_{1-3} alkyl; R^{12} is hydrogen or R^{14} (wherein R^{14} is alkyl moiety of chemically or physiologically hydrolyzable alkyl ester or M (wherein M is NH_4, sodium, potassium, ½ calcium or a hydrogen addition product to nitrogen of lower alkylamine, di-lower alkylamine or tri-lower alkylamine)): two R^{13} are independently primary or secondary C_{1-6} alkyl; or two R^{13} together form $—(CH_2)_2$ or $—(CH_2)_3—$; R^{16} and R^{17} are independently hydrogen or C_{1-3} alkyl; or R^{16} and R^{17} together form $—(CH_2)_2—$ or $—(CH_2)_3—$; and R^5 is cyclopropyl.

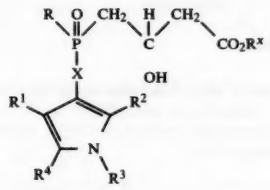
5,025,000

PHOSPHORUS-CONTAINING HMG-COA REDUCTASE INHIBITOR COMPOUNDS

Donald S. Karanewsky, Robbinsville, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Mar. 2, 1990, Ser. No. 487,366
Int. Cl.[5] C07D *471/04;* A61K *31/435*
U.S. Cl. 514—80 **14 Claims**

1. A compound having the structure



wherein X is $—(CH_2)_a—$, —CH=CH—, or —C≡C—; a is 1,2 or 3; R is OH or lower alkoxy; R^x is alkali metal, lower alkyl or H; one of R^1 and R^2 is substituted phenyl and the other of R^1 and R^2 is lower alkyl; R^3 and R^4 together are —CH= CH—$_2$ or $—CH_2—_4$ and are joined to complete a six-membered carbocyclic ring.

14. A method of inhibiting cholesterol biosynthesis which comprises administering to a patient in need of such treatment an effective cholesterol biosynthesis inhibiting amount of a compound as defined in claim **1**.

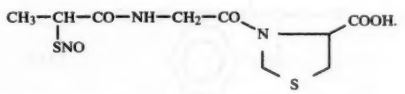
5,025,001

S-NITROSO DERIVATIVES OF ACE INHIBITORS AND THE USE THEREOF

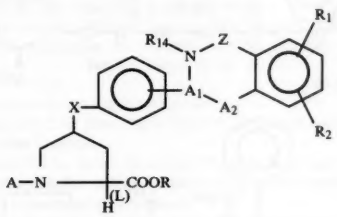
Joseph Loscalzo, Dedham, and John Cooke, Needham Heights, both of Mass., assignors to Brigham and Women's Hospital, Boston, Mass.

Continuation-in-part of Ser. No. 206,763, Jun. 15, 1988. This application Mar. 24, 1989, Ser. No. 328,397
Int. Cl.[5] A61K *31/505, 31/54, 31/425, 31/40*
U.S. Cl. 514—91 **22 Claims**

1. A pharmaceutically acceptable S-nitrosothiol having the formula:



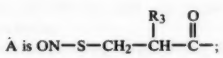
2. A pharmaceutically acceptable S-nitrosothiol having the formula:



wherein

X is oxygen or sulfur;

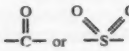
$—A_1—A_2—$ is —CH—NH or —C=N—;



R is selected from hydrogen, lower C_1–C_4) alkyl, benzyl, benzhydryl, and salt forming ion;

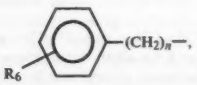
R_1 and R_2 are independently selected from hydrogen, halogen, lower alkyl, lower alkoxy, halo substituted lower alkyl, nitro, and $—SO_2NH_2$;

Z id



R_3 is hydrogen, lower alkyl, halo substituted lower alkyl, phenyl, benzyl, phenethyl, or cycloalkyl;

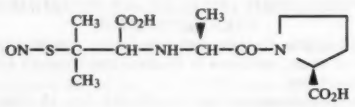
R_{14} is hydrogen, lower alkyl, cycloalkyl-$(CH_2)_n$-, wherein n is one, two, three or four;

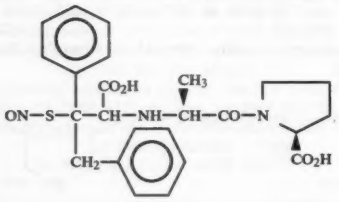


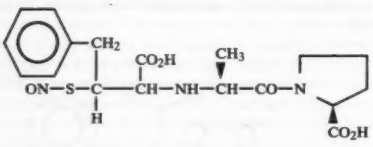
halo substituted lower alkyl, hydroxy substituted lower alkyl, $-(CH_2)_q-N$(lower alkyl)$_2$, or $-(CH_2)_q-NH_2$, wherein q is one, two, three or four; and

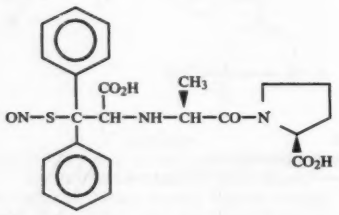
R_6 is hydrogen, lower alkyl, lower alkoxy, halogen, or hydroxy.

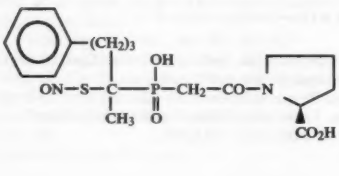
3. A pharmaceutically acceptable S-nitrosothiol selected from the group of the following formulae:











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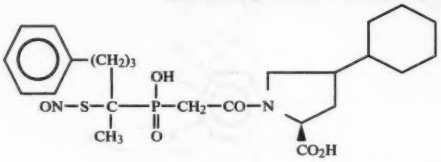
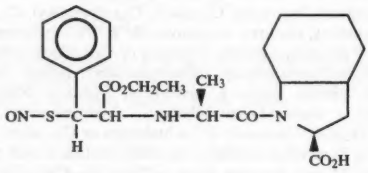
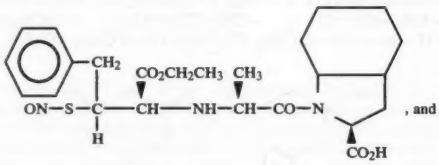
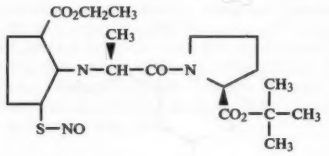






, and



5. A method for treating a cardiovascular-renal disease, comprising administering an effective amount of the S-nitrosothiol of any one of claims 1-3 to an animal in need of such treatment.

5,025,002

PROCESS FOR CONTROL OF MICROORGANISMS WITH PHOSPHORUS-BASED COMPOSITIONS

Reinhard Effenberger, Haifa, and David Direktor, Qiryat Ata, both of Israel, assignors to Bromine Compounds Ltd., Beer-Sheva, Israel

Filed Aug. 31, 1988, Ser. No. 238,722
Int. Cl.[5] A01N *57/00*
U.S. Cl. 514—112 **8 Claims**

1. A method of killing or inhibiting the growth of harmful microorganisms selected from the group consisting of gram-negative bacteria, gram-positive bacteria and yeast, which comprises contacting said microorganisms with a biocidal composition comprising an effective biocidal or growth-inhibiting amount of at least one compound having the formula

$$(RO)_2P(O)CXYZ$$

wherein R is H, a C_{1-12} aliphatic hydrocarbon radical or a phenyl radical, X is H or halogen, Y is halogen, and Z is CN, with the proviso that X and Y cannot both be Cl.

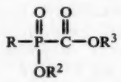
5,025,003

ISOPRENOID PHOSPHINYLFORMIC ACID SQUALENE SYNTHETASE INHIBITORS

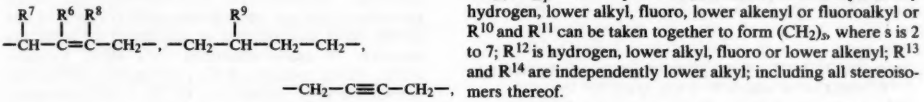
Scott A. Biller, Ewing, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Sep. 18, 1989, Ser. No. 408,974
Int. Cl.[5] C07F 9/38, 9/40; A61K 31/66
U.S. Cl. 514—120 **23 Claims**

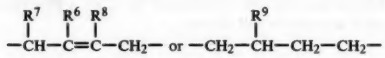
1. A compound having the formula



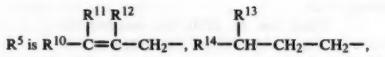
wherein R^2 is a metal ion, lower alkyl or H; R^3 is a metal ion or lower alkyl; R is R^1—$(CH_2)_n$—, R^1—$(CH_2)_m$O— which contains at least 12 carbons in the carbon chain, or R^1—$(CH_2)_m$$OCH_2$—, wherein n is an integer from 1 to 4 and m is an integer from 0 to 3; and R^1 is R^5—Q^1—Q^2—Q^3— wherein Q^1, Q^2 and Q^3 are independently:



or a bond, at least one of Q^1 and/or Q^2 being other than a bond; if any of Q^1, Q^2 and Q^3 is

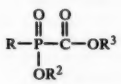


then R^6 is H, lower alkyl, fluoro or fluoroalkyl; R^7 is H, fluoro, lower alkyl or alkylthio; R^8 is H, fluoro, trimethylsilyl or lower alkyl; R^9 is H, or lower alkyl;

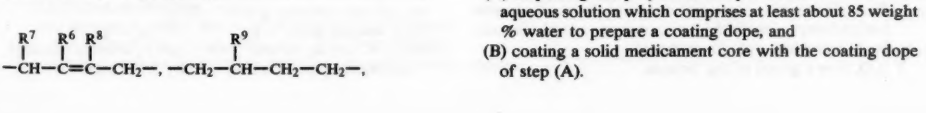


R^{16}—C≡C—CH_2—(wherein R^{16} is lower alkyl or H), or $CH_3(CH_2)_p$— where p is 2 to 7; R^{10} and R^{11} are independently hydrogen, lower alkyl, fluoro, lower alkenyl or fluoroalkyl or R^{10} and R^{11} can be taken together to form $(CH_2)_s$, where s is 2 to 7; R^{12} is hydrogen, lower alkyl, fluoro or lower alkenyl; R^{13} and R^{14} are independently lower alkyl; including all stereoisomers thereof.

13. A method of inhibiting cholesterol biosynthesis, which comprises administering to a patient in need of such treatment an effective cholesterol biosynthesis inhibiting amount of a compound having the formula



wherein R^2 is a metal ion, lower alkyl or H; R^3 is a metal ion or lower alkyl; R is R^1—$(CH_2)_n$—, R^1—$(CH_2)_m$O— which contains at least 12 carbons in the carbon chain, or R^1—$(CH_2)_m$$OCH_2$—, wherein n is an integer from 1 to 4 and m is an integer from 0 to 3; and R^1 is R^5—Q^1—Q^2—Q^3— wherein Q^1, Q^2 and Q^3 are independently:



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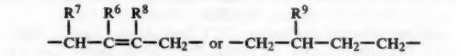
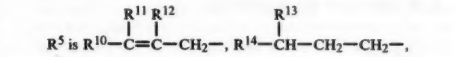
or a bond, at least one of Q^1 and/or Q^2 being other than a bond; if any of Q^1, Q^2 and Q^3 is



then R^6 is H, lower alkyl, fluoro or fluoroalkyl; R^7 is H, fluoro, lower alkyl or alkylthio; R^8 is H, fluoro, trimethylsilyl or lower alkyl; R^9 is H, or lower alkyl;



R^{16}—C≡C—CH_2—(wherein R^{16} is lower alkyl or H), or $CH_3(CH_2)_p$— where p is 2 to 7; R^{10} and R^{11} are independently hydrogen, lower alkyl, fluoro, lower alkenyl or fluoroalkyl or R^{10} and R^{11} can be taken together to form $(CH_2)_s$, where s is 2 to 7; R^{12} is hydrogen, lower alkyl, fluoro or lower alkenyl; R^{13} and R^{14} are independently lower alkyl; including all stereoisomers thereof.

5,025,004

WATER-DISPERSIBLE POLYMERIC COMPOSITIONS

Stephen H. W. Wu, Kingsport; Carol J. Greene, Mt. Carmel, and Mahendra K. Sharma, Kingsport, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 205,765, Jun. 13, 1988, Pat. No. 4,960,814. This application Jun. 4, 1990, Ser. No. 532,826
Int. Cl.[5] A61K 9/32
U.S. Cl. 514—165 **45 Claims**

1. A polymeric composition comprising

(A) about 42.5 to about 98 weight % of at least one water insoluble polymer,

(B) about 0.5 to about 30 weight % of at least one oil-in-water emulsifier which is polymeric, water soluble or water dispersible and nonionic.

(C) about 1 to about 27.5 weight % of at least one water-in-oil emulsifier which is water insoluble; anionic or amphoteric; more hydrophobic than said oil-in-water emulsifier; substantially dispersible in a low molecular weight, more volatile than water, and substantially water immiscible organic solvent; and compatible with said oil-in-water emulsifier,

said polymeric composition being in the form of particles having an average particle size of about 0.1–0.8 μm.

10. A process for preparing a solid dosage form comprising:

(A) dispersing the polymeric composition of claim **1** in an aqueous solution which comprises at least about 85 weight % water to prepare a coating dope, and

(B) coating a solid medicament core with the coating dope of step (A).

5,025,005

LIPID DERIVATIVES, THEIR PRODUCTION AND USE

Hiroaki Nomura, Takatsuki; Kohei Nishikawa, Kyoto; Susumu Tsushima, Suita, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 141,276, Jan. 6, 1988, abandoned, which is a division of Ser. No. 906,310, Sep. 12, 1986, Pat. No. 4,737,518, which is a continuation-in-part of Ser. No. 719,579, Apr. 3, 1985, abandoned. This application Jul. 23, 1990, Ser. No. 556,280

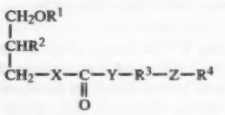
Claims priority, application PCT Int'l Appl., Apr. 3, 1984, PCT/JP84/00163; Oct. 11, 1984, PCT/JP84/00476; Feb. 15, 1985, PCT/JP85/00062; Japan, Oct. 1, 1985, 60-219874

The portion of the term of this patent subsequent to Apr. 12, 2005, has been disclaimed.

Int. Cl.[5] A61K *31/33*

U.S. Cl. 514—183 41 Claims

1. A compound of the formula:



wherein R^1 is C_{10-30} alkyl or a group of the formula R^5NHCO— in which R^5 is C_{10-30} alkyl;

R^2 is hydrogen, hydroxy, C_{1-5} alkoxy, phenyl-C_{1-5} alkoxy, C_{1-5} alkanoyloxy, benzoyloxy, phenoxycarbonyloxy, C_{1-5} alkoxycarbonyloxy, a group of the formula

(in which W is oxygen or sulfur, and R^6 and R^7 are independently hydrogen or C_{1-5} alkyl or both, taken together with the adjacent nitrogen atom, form a 3- to 7-membered hetero ring selected from the class consisting of 1-aziridinyl, 1-azetidinyl, 1-pyrrolidinyl, piperidino, 1-perhydroazepinyl, 1-piperazinyl, morpholino, thiomorpholino, 1-perhydrodiazepinyl, 4-perhydrooxazepinyl and 4-perhydrothiazepinyl), amino, C_{1-5} alkanoylamino, benzoylamino, optionally oxo-substituted 3- to 7-membered monocyclic amino selected from the class consisting of 1-aziridinyl, 1-azetidinyl, 1-pyrrolidinyl, piperidino, 1-perhydroazepinyl, 1-piperazinyl, morpholino, thiomorpholino, 1-perhydroazepinyl, 1-piperazinyl, morpholino, thiomorpholino, 1-perhydrodiazepinyl, 4-perhydrooxazepinyl and 4-perhydrothiazepinyl, or optionally oxo-substituted 2-isoindolinyl;

R^3 is C_{1-8} alkylene;

R^4 is hydrogen, C_{1-6} alkyl or phenyl-C_{1-6} alkyl;

X is O, S or a group of the formula:

(in which R^8 is hydrogen, optionally carboxy or C_{1-5} alkoxycarbonyl substituted C_{1-5} alkyl, C_{1-5} alkanoyl, benzoyl, phenoxycarbonyl, C_{1-5} alkoxycarbonyl, carbamoyl, mono- or di-C_{1-5} alkylcarbamoyl or 3- or 7-membered cyclic aminocarbonyl selected from the class consisting of (aziridin-1-yl)carbonyl, (azetidin-1-yl)carbonyl, (pyrrolidin-1-yl)carbonyl, piperidino-carbonyl, (perhydroazepin-1-yl)carbonyl, (piperazin-1-yl)carbonyl, morpholinocarbonyl and thiomorpholinocarbonyl);

Y is O, S or a group of the formula

(in which R^9 is hydrogen, optionally carboxy or C_{1-5} alkoxycarbonyl substituted C_{1-5} alkyl, C_{1-5} alkanoyl, benzoyl, phenoxycarbonyl, C_{1-5} alkoxycarbonyl, carbamoyl, mono- or di-C_{1-5} alkylcarbamoyl or 3- to 7-membered cyclic aminocarbonyl selected from the class consisting of (aziridin-1-yl)carbonyl, (azetidin-1-yl)carbonyl, (pyrrolidin-1-yl)carbonyl, piperidino-carbonyl, (perhydroazepin-1-yl)carbonyl, (piperazin-1-yl)-carbonyl, morpholinocarbonyl and thiomorpholinocarbonyl); and R^8 and R^9 or R^4 and R^9 may form C_{1-4} alkenylene or alkylene unsubstituted or substituted by oxo; and

Z is a nitrogen-containing heterocyclic group selected from the class consisting of azetidinyl, pyrrolidinyl, piperidinyl, perhydroazepinyl, pyrrolinyl, pyrazolinyl, pyrrolyl, pyridyl, oxazolyl, thiazolyl, pyridazinyl, pyrimidyl, pyrazinyl, imidazolyl, morpholinyl, thiomorpholinyl, piperazinyl, pyrazolidinyl, indolyl, isoindolyl, 1H-indazolyl, purinyl, quinolinyl, isoquinolinyl, 1,2,3,4-tetrahydroquinolinyl, perhydroindolyl and perhydroisoquinolinyl, each of said groups being unsubstituted or substituted by optionally hydroxy- or amino-substituted C_{1-4} alkyl, hydroxy, amino, imino, mono-or di-C_{1-4} alkylamino, carbamoyl, ureido, carboxy, carboxylato or C_{1-4} alkoxycarbonyl, wherein a nitrogen atom in said nitrogen-containing heterocyclic group may be converted into a quaternary salt with R^4, wherein R^3 is bound to Z at a position adjacent to the nitrogen atom contained in said nitrogen-containing heterocyclic group represented by Z or a pharmaceutically acceptable salt thereof.

5,025,006

2-BIPHENYL-CARBAPENEM ANTIBACTERIAL AGENTS

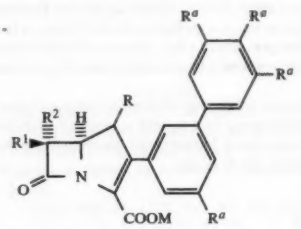
Frank P. Dininno, Old Bridge, and Thomas N. Salzmann, North Plainfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jun. 26, 1990, Ser. No. 543,946

Int. Cl.[5] C07D *487/04;* A01K *31/40*

U.S. Cl. 514—210 16 Claims

1. A compound of the formula:



(I)

wherein:

R is H or CH_3;

R^1 and R^2 are independently H, CH_3—, CH_3CH_2—, $(CH_3)_2CH$—, $HOCH_2$—, $CH_3CH(OH)$—, $(CH_3)_2C(OH)$—, $FCH_2CH(OH)$—, $F_2CHCH(OH)$—, $F_3CCH(OH)$—, $CH_3CH(F)$—, CH_3CF_2—, or $(CH_3)_2C(F)$—;

R^a are independently selected from the group consisting of hydrogen and the radicals set out below:

(a) a trifluoromethyl group: $—CF_3$;

(b) a halogen atom: —Br, —Cl, —F, or —I;

(c) C_1–C_4 alkoxy radical: $—OC_{1-4}$ alkyl, wherein the alkyl is optionally mono-substituted by R^q, where

R^q is a member selected from the group consisting of —OH, —OCH_3, —CN, —$C(O)NH_2$, —$OC(O)NH_2$, CHO, —$OC(O)N(CH_3)_2$, —SO_2NH_2, —$SO_2N(CH_3)_2$, —$SOCH_3$, —SO_2CH_3, —F, —CF_3, —$COOM^a$ (where M^a is hydrogen, alkali metal, methyl or phenyl), tetrazolyl (where the point of attachment is the carbon atom of the tetrazole ring and one of the nitrogen atoms is mono-substituted by M^a as defined above) and —SO_3M^b (where M^b is hydrogen or an alkali metal);

(d) a hydroxy group: —OH;

(e) a carbonyloxy radical: —$O(C{=}O)R^z$, where

R^z is C_{1-4} alkyl or phenyl, each of which is optionally mono-substituted by R^q as defined above;

(f) a carbamoloxy radical: —$O(C{=}O)N(R^y)R^z$ where

R^y and R^z are independently H, C_{1-4} alkyl (optionally mono-substituted by R^q as defined above), together a 3- to 5-membered alkylidene radical to form a ring (optionally substituted with R^q as defined above) or together a 2- to 4-membered alkylidene radical, interrupted by —O—, —S—, —S(O)— or —$S(O)_2$—, to form a ring (where the ring is optionally mono-substituted with R_q as defined above);

(g) a sulfur radical: —$S(O)_n$—R^z where n=0-2, and R^z is defined above;

(h) a sulfamoyl group: —$SO_2N(R^y)R^z$ where R^y and R^z are as defined above;

(i) azido: N_3

(j) a formamido group: —$N(R^t)(C{=}O)H$, where

R^t is H or C_{1-4} alkyl, and the alkyl thereof is optionally mono-substituted by R^q as defined above;

(k) a (C_1–C_4 alkyl)carbonylamino radical: —$N(R^t)(C{=}O)C_{1-4}$ alkyl, where R^t is as defined above, and the alkyl group is also optionally mono-substituted by R^q as defined above;

(l) a (C_1–C_4 alkoxy) carbonylamino radical: —$N(R^t)(C{=}O)OC_{1-4}$ alkyl, where R^t is as defined above, and the alkyl group is also optionally mono-substituted by R^q as defined above;

(m) a ureido group: —$N(R^t)(C{=}O)N(R^y)R^z$ where R^t, R^y and R^z are as defined above;

(n) a sulfonamido group: —$N(R^t)SO_2R^S$, where R^s and R^t are as defined above;

(o) a cyano group: —CN;

(p) a formyl or acetalized formyl radical: —(C=O)H or —$CH(OCH_3)_2$;

(q) (C_1–C_4 alkyl)carbonyl radical wherein the carbonyl is acetalized: —$C(OCH_3)_2C_{1-4}$ alkyl, where the alkyl is optionally mono-substituted by R^q as defined above;

(r) carbonyl radical: —$(C{=}O)R^z$, where R^z is as defined above;

(s) a hydroximinomethyl radical in which the oxygen or carbon atom is optionally substituted by a C_1–C_4 alkyl group: —$(C{=}NOR^z)R^y$ where R^y and R^z are as defined above, except they may not be joined together to form a ring;

(t) a (C_1–C_4 alkoxy)carbonyl radical: —$(C{=}O)OC_{1-4}$ alkyl, where the alkyl is optionally mono-substituted by R^q as defined above;

(u) a carbamoyl radical: —$(C{=}O)N(R^y)R^z$ where R^y and R^z are as defined above;

(v) an N-hydroxycarbamoyl or N(C_1–C_4 alkoxy)carbamoyl radical in which the nitrogen atom may be additionally substituted by a C_1–C_4 alkyl group: —$(C{=}O)$—$N(OR^y)R^z$ where R^y and R^z are as defined above, except they may not be joined together to form a ring;

(w) a thiocarbamoyl group: —$(C{=}S)N(R^y)(R^z)$ where R^y and R^z are as defined above;

(x) carboxyl: —$COOM^b$, where M^b above;

(y) thiocyanate: —SCN;

(z) trifluoromethylthio: —SCF_3;

(aa) tetrazolyl, where the point of attachment is the carbon atom of the tetrazole ring and one of the nitrogen atoms is mono-substituted by hydrogen, an alkali metal or a C_1–C_4 alkyl optionally substituted by R^q as defined above;

(ab) an anionic function selected from the group consisting of: phosphono [$P{=}O(OM^b)_2$]; alkylphosphono {$P{=}O(OM^b)$—[$O(C_1$–C_4 alkyl)]}; alkylphosphinyl [$P{=}O(OM^b)$—(C_1–C_4 alkyl)]; phosphoramido [$P{=}O(OM^b)N(R^y)R^z$ and $P{=}O(OM^b)NHR^x$]; sulfino (SO_2M^b); sulfo (SO_3M^b); acylsulfonamides selected from the structures $CONM^bSO_2R^x$, $CONM^bSO_2N(R^y)R^z$, $SO_2NM^bCON(R^y)R^z$; and SO_2NM^bCN, where

R^x is phenyl or heteroaryl, where heteroaryl is a monocyclic aromatic hydrocarbon group having 5 or 6 ring atoms, in which a carbon atom is the point of attachment, in which one of the carbon atoms has been replaced by a nitrogen atom, in which one additional carbon atom is optionally replaced by a heteroatom selected from O or S, and in which from 1 to 2 additional carbon atoms are optionally replaced by a nitrogen heteroatom, and where the phenyl and heteroaryl are optionally mono-substituted by R^q, as defined above; M^b is as defined above; and R^y and R^z are as defined above;

(ac) C_5–C_7 cycloalkyl group in which one of the carbon atoms in the ring is replaced by a heteroatom selected from O, S, NH or N(C_1–C_4 alkyl) and in which one additional carbon atom may be replaced by NH or N(C_1–C_4 alkyl), and in which at least one carbon atom adjacent to each nitrogen heteroatom has both of its attached hydrogen atoms replaced by one oxygen thus forming a carbonyl moiety and there are one or two carbonyl moieties present in the ring;

(ad) C_2–C_4 alkenyl radical, optionally mono-substituted by one of the substituents (a) to (ac) above and phenyl which is optionally substituted by R^q as defined above;

(ae) C_2–C_4 alkynyl radical, optionally mono-substituted by one of the substituents (a) to (ac) above;

(af) C_1–C_4 alkyl radical;

(ag) C_1–C_4 alkyl mono-substituted by one of the substituents (a)–(ac) above;

(ah) a 2-oxazolidinonyl moiety in which the point of attachment is the nitrogen atom of the oxazolidinone ring, the ring oxygen atom is optionally replaced by a heteroatom selected from —S— and $>NR^t$ (where R^t is as defined above) and one of the saturated carbon atoms of the oxazolidinone ring is optionally mono-substituted by one of the substituents (a) to (ag) above;

M is selected from:

(i) hydrogen;

(ii) a pharmaceutically acceptable esterifying group or removable carboxyl protecting group; or

(iii) an alkali metal or other pharmaceutically acceptable cation.

5,025,007

2-(9-FLUORENONYL)-CARBAPENEM ANTIBACTERIAL AGENTS

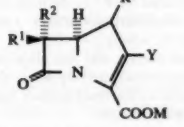
Mark L. Greenlee, Rahway; Frank P. DiNinno, Old Bridge; Lovji D. Cama, Tenafly, and James V. Heck, Scotch Plains, all of N.J., assignors to Merck & Co., Inc., Rahway, N.Y.

Filed Aug. 1, 1990, Ser. No. 561,541

Int. Cl.[5] C07D *487/04;* A61K *31/40*

U.S. Cl. 514—210 **19 Claims**

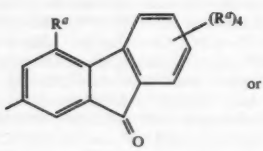
1. A compound of formula



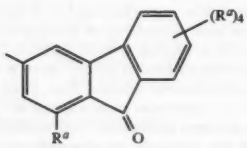
I

wherein:

Y is


(a)

or


(b)

R is H or CH_3;

R^1 and R^2 are independently H, CH_3—, CH_3CH_2—, $(CH_3)_2CH$—, $HOCH_2$—, $CH_3CH(OH)$—, $(CH_3)_2C(OH)$—, $FCH_2CH(OH)$—, $F_2CHCH(OH)$—, $F_3CCH(OH)$—, $CH_3CH(F)$—, CH_3CF_2—, or $(CH_3)_2C(F)$—;

R^a are independently selected from the radicals set out below, provided that no more than four R^a substituents are other than hydrogen:

(a) hydrogen;

(b) a trifluoromethyl group; —CF_3;

(c) a halogen atom: —Br, —Cl, —F, or —I;

(d) C_1–C_4 alkoxy radical: —OC_{1-4} alkyl, wherein the alkyl is optionally mono-substituted by R^q, where

R^q is a member selected from the group consisting of: —OH, —OCH_3, —CN, —$C(O)NH_2$, —$OC(O)NH_2$, CHO, —$OC(O)N(CH_3)_2$, —SO_2NH_2, —$SO_2N(CH_3)_2$, —$SOCH_3$, —SO_2CH_3, —F, —CF_3, —$COOM^a$ (where M^a is hydrogen, alkali metal, methyl or phenyl), tetrazolyl (where the point of attachment is the carbon atom of the tetrazole ring and one of the nitrogen atoms is mono-substituted by M^a as defined above) and —SO_3M^b (where M^b is hydrogen or an alkali metal);

(e) a hydroxy group: —OH;

(f) a carbonyloxy radical of formula —$O(C{=}O)R^s$, where Rs is C_{1-4} alkyl or phenyl, each of which is optionally mono-substituted by R^q as defined above;

(g) a carbamoyloxy radical of formula —$O(C{=}O)N(R^y)R^z$ where

R^y and R^z are independently: H, C_{1-4} alkyl (optionally mono-substituted by R^q as defined above), together a 3- to 5-membered alkylidene radical to form a ring (optionally substituted with R^q as defined above) or together a 2- to 4-membered alkylidene radical, interrupted by —O—, —S—, —S(O)— or —$S(O)_2$—, to form a ring (where the ring is optionally mono-substituted with R^q as defined above);

(h) a sulfur radical: —$S(O)_n$—R^s where n = 0–2, and R^s is defined above;

(i) a sulfamoyl group: —$SO_2N(R^y)R^z$ where R^y and R^z are as defined above;

(j) azido: N_3

(k) a formamido group: —$N(R^t)(C{=}O)H$, where

R^t is H or C_{1-4} alkyl, and the alkyl thereof is optionally mono-substituted by R^q as defined above;

(l) a (C_1–C_4 alkyl)carbonylamino radical: —$N(R^t)(C{=}O)C_{1-4}$ alkyl, where

R^t is as defined above, and the alkyl group is also optionally mono-substituted by R^q as defined above;

(m) a (C_1–C_4 alkoxy)carbonylamino radical: —$N(R^t)(C{=}O)OC_{1-4}$ alkyl, where

R^t is as defined above, and the alkyl group is also optionally mono-substituted by R^q as defined above;

(n) a ureido group: —$N(R^t)(C{=}O)N(R^y)R^z$ where R^t, R^y and R^z are as defined above;

(o) a sulfonamido group: —$N(R^t)SO_2R^s$, where R^s and R^t are as defined above;

(p) a cyano group: —CN;

(q) a formyl or acetalized formyl radical: —$(C{=}O)H$ or —$CH(OCH_3)_2$;

(r) (C_1–C_4 alkyl)carbonyl radical where the carbonyl is acetalized: —$C(OCH_3)_2C_{1-4}$ alkyl, where the alkyl is optionally mono-substituted by R^q as define above;

(s) carbonyl radical: —$(C{=}O)R^s$, where R^s is as defined above;

(t) a hydroximinomethyl radical in which the oxygen or carbon atom is optionally substituted by a C_1–C_4 alkyl group: —$(C{=}NOR^z)R^y$, where

R^y and R^z are as defined above, with the previse that they are not to be joined together to form a ring;

(u) a (C_1–C_4 alkoxy)carbonyl radical: —$(C{=}O)OC_{1-4}$ alkyl, where the alkyl is optionally mono-substituted by R^q as defined above;

(v) a carbamoyl radical: —$(C{=}O)N(R^y)R^z$ where R^y and R^z are as defined above;

(w) an N-hydroxycarbamoyl or N(C_1–C_4 alkoxy)carbamoyl radical in which the nitrogen atom may be additionally substituted by a C_1–C_4 alkyl group: —$(C{=}O)$—$N(OR^y)R^z$ where R^y and R^z are as defined above, except they may not be joined together to form a ring;

(x) a thiocarbamoyl group: —$(C{=}S)N(R^y)R^z$ where R^y and R^z are as defined above;

(y) carboxyl: —$COOM^b$, where M^b is as defined above;

(z) thiocyanate: SCN;

(aa) trifluoromethylthio: —SCF_3;

(ab) tetrazolyl, where the point of attachment is the carbon atom of the tetrazole ring and one of the nitrogen atoms is mono-substituted by hydrogen, an alkali metal or a C_1–C_4 alkyl optionally substituted by R^q as defined above;

(ac) an anionic function selected from the group consisting of: phosphono: $[P{=}O(OM^b)_2]$; alkylphosphono: $\{P{=}O(OM^b)$—$[O(C_1$–C_4 alkyl)$]\}$; alkylphosphinyl: $[P{=}O(OM^b)$—(C_1–C_4 alkyl)]; phosphoramido: $[P{=}O$-$(OM^b)N(R^y)R^z$ and $P{=}O(OM^b)NHR^x]$; sulfino: (SO_2NM^b); sulfo: (SO_3M^b); acylsulfonamides: selected from the structures $CONM^bSO_2R^x$, $CONM^bSO_2N$-$(R^y)R^z$, $SO_2M^bCON(R^y)R^z$; and SO_2NM^bCN, where

R^x is phenyl or heteroaryl, where heteroaryl is a monocyclic aromatic hydrocarbon group having 5 or 6 ring atoms, in which a carbon atom is the point of attachment, in which one of the carbon atoms has been replaced by a nitrogen atom, in which one additional carbon atom is optionally replaced by a heteroatom selected from O or S, and in which from 1 to 2 additional carbon atoms are optionally replaced by a nitrogen heteroatom, and where the phenyl and heteroaryl are optionally monosubstituted by R^q, as defined above; M^b is as defined above; and R^y and R^z are as defined above;

(ad) C_5–C_7 cycloalkyl group in which one of the carbon atoms in the ring is replaced by a heteroatom selected from O, S, NH, or N(C_1–C_4 alkyl) and in which one additional carbon may be replaced by the NH or N(C_1–C_4 alkyl), and in which at least one carbon atom adjacent to each heteroatom has both of its attached hydrogen atoms replaced by one oxygen thus forming a carbonyl moiety and there are one or two carbonyl moieties present in the ring;

(ae) C_2–C_4 alkenyl radical, optionally mono-substituted by one of the substituents (b) to (ad) above and phenyl which is optionally substituted by R^q as defined above;

(af) C_2–C_4 alkynyl radical, optionally mono-substituted by one of the substitutents (b) to (ad) above;

(ag) C_1–C_4 alkyl radical;

(ah) C_1–C_4 alkyl mono-substituted by one of the substituents (b) to (ad) above;

(ai) a 2-oxazolidinonyl moiey in which the point of attachment is the nitrogen atom of the oxazolidinone ring, the ring oxygen atom is optionally replaced by a heteroatom selected from S and NR^t (where R^t is as defined above) and one of the saturated carbon atoms of the oxazolidinone ring is optionally mono-substituted by one of the substituents (b) to (ah) above;

M is selected from:

(i) hydrogen;

(ii) a pharmaceutically acceptable esterifying group or removable carboxyl protecting group; or

(iii) an alkali metal or other pharmaceutically acceptable cation.

5,025,008

2-(SUBSTITUTED-DIBENZOFURANYL AND DIBENZOTHIENYL) CARBAPENEM ANTIBACTERIAL AGENTS

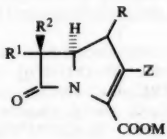
Frank P. DiNinno, Old Bridge; Thomas N. Salzmann, North Plainfield, and Mark L. Greenlee, Rahway, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 376,193, Jun. 30, 1989, abandoned, which is a continuation of Ser. No. 362,916, Jun. 8, 1989, abandoned. This application May 24, 1990, Ser. No. 526,534

Int. Cl.[5] C07D *487/04*; A61K *31/40*

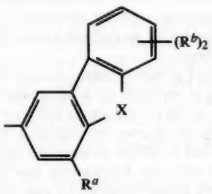
U.S. Cl. 514—210 **15 Claims**

1. A compound of the formula:



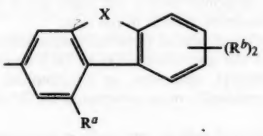
(I.)

where Z is:



(A.)

or



(B.)

wherein:

X is O or $S(O)_{0-2}$;

R is H or CH_3;

R^1 and R^2 are independently H, CH_3—, CH_3CH_2—, $(CH_3)_2CH$—, $HOCH_2$—, $CH_3CH(OH)$—, $(CH_3)_2C(OH)$—, $FCH_2CH(OH)$—, $F_2CHCH(OH)$—, $F_3CCH(OH)$—, $CH_3CH(F)$—, CH_3CF_2—, or $(CH_3)_2C(F)$—;

R^a and R^b are independently selected from the group consisting of hydrogen and the radicals set out below:

(a) a trifluoromethyl group; $—CF_3$;

(b) a halogen atom: —Br, —Cl, —F, or —I;

(c) C_1–C_4 alkoxy radical; $—OC_{1-4}$ alkyl, wherein the alkyl is optionally mono-substituted by R^q, where

R^q is a member selected from the group consisting of —OH; $—OCH_3$; —CN; $—C(O)NH_2$; $—OC(O)NH_2$; CHO; $—OC(O)N(CH_3)_2$; $—SO_2NH_2$; $—SO_2N(CH_3)_2$; $—SOCH_3$; SO_2CH_3; —F; $—CF_3$; $—COOM^a$ (where M^a is hydrogen, alkali metal, methyl or phenyl); tetrazolyl (where the point of attachment is the carbon atom of the tetrazole ring and one of the nitrogen atoms is mono-substituted by M^a as defined above); and $—SO_3M^b$ (where M^b is hydrogen or an alkali metal);

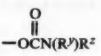
(d) a hydroxy group; —OH;

(e) a carbonyloxy radical;

where

R^s is C_{1-4} alkyl, phenyl, or heteroaryl, each of which is optionally mono-substituted by R^q as defined above, and where heteroaryl is a monocyclic aromatic hydrocarbon group having 5 or 6 ring atoms in which one of the carbon atoms has been replaced by a nitrogen atom, one additional carbon atom is optionally replaced by a heteroatom selected from O and S, and from 1 to 3 additional carbon atoms are optionally replaced by a nitrogen heteroatom;

(f) a carbamoyloxy radical;



where

R^y and R^z are independently H, C_{1-4} alkyl (optionally mono-substituted by R^q as defined above), together a 3- to 5-membered alkylidene radical to form a ring (optionally substituted with R^q as defined above), or together a 2- to 5-membered alkylidene radical, interrupted by —O—, —S—, —S(O)—, or $—S(O)_2—$, to form a ring (optionally mono-substituted with R^q as defined above);

(g) a sulfur radical;

where n=0–2, and R^s is as defined above;

(h) a sulfamoyl group; $—SO_2N(R^y)R^z$ where R^y and R^z are as defined above;

(i) azido; N_3

(j) a formylamino group:

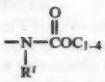
where

R^t is H or C_{1-4} alkyl, and the alkyl thereof is optionally mono-substituted by R^q as defined above;

(k) (C_1–C_4 alkyl)carbonylamino radical:

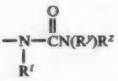
alkyl, where R^t is as defined above, and the alkyl group is also optionally mono-substituted by R^q as defined above;

(l) a (C_1–C_4 alkoxy) carbonylamino radical:



alkyl, where R^t is as defined above, and the alkyl group is also optionally mono-substituted by R^q as defined above;

(m) a ureido group:



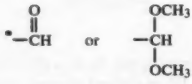
where R^t, R^y and R^z are as defined above;

(n) a sulfonamide group:

where R^s and R^t are as defined above;

(o) a cyano group: —CN;

(p) a formyl or acetalized formyl radical:



(q) (C_1–C_4 alkyl)carbonyl radical wherein the carbonyl is acetalized:

alkyl, where the alkyl is optionally mono-substituted by R^q as defined above;

(r) carbonyl radical:

where R^s is as defined above;

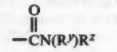
(s) a hydroximinomethyl radical in which the oxygen or carbon atom is optionally substituted by a C_1–C_4 alkyl group;

where R^y and R^z are as defined above, except they may not be joined together to form a ring;

(t) a (C_1–C_4 alkoxy)carbonyl radical:

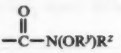
alkyl, where the alkyl is optionally mono-substituted by R^q as defined above;

(u) a carbamoyl radical:



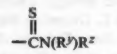
where R^y and R^z are as defined above;

(v) an N-hydroxycarbamoyl or N(C_1–C_4 alkoxy)carbamoyl radical in which the nitrogen atom may be additionally substituted by a C_1–C_4 alkyl group:



where R^y and R^z are as defined above, except that they may not be joined together to form a ring;

(w) a thiocarbamoyl group:



where R^y and R^z are as defined above;

(x) carboxyl; —$COOM^b$, where M^b is as defined above;

(y) thiocyanate; —SCN;

(z) trifluoromethylthio: —SCF_3;

(aa) tetrazolyl, where the point of attachment is the carbon atom of the tetrazole ring and one of the nitrogen atoms is mono-substituted by hydrogen, an alkali metal or a C_1–C_4 alkyl optionally substituted by R^q as defined above;

(ab) an anionic function selected from the group consisting of: phosphone [$P{=}O(OM^b)_2$]; alkylphosphono {$P{=}O(OM^b){-}[O(C_1$–C_4 alkyl)]}; alkylphosphinyl [$P{=}O(OM^b){-}(C_1$–C_4 alkyl)]; phosphoramido [$P{=}O(OM^b)N(R^y)R^z$ and $P{=}O(OM^b)NHR^x$]; sulfino (SO_2MC^b; sulfo (SO_3M^b); acylsulfonamides selected from the structures $CONM^bSO_2R^x$, $CONM^bSO_2N(R^y)R^z$, $SO_2NM^bCON(R^y)R^z$; and SO_2NM^bCN, where R^x is phenyl or heteroaryl, where heteroaryl is as defined above under R^s, and the phenyl and heteroaryl are optionally mono-substituted by R^q, as defined above; M^b, R^y and R^z are as defined above;

(ac) C_5–C_7 cycloalkyl group in which one of the carbon atoms in the ring is replaced by a heteroatom selected from O, S, NH, or N(C_1–C_4 alkyl) and in which one additional carbon atom may be replaced by NH or N(C_1–C_4 alkyl), and in which at least one carbon atom adjacent to each nitrogen heteroatom has both of its attached hydrogen atoms replaced by one oxygen thus forming a carbonyl moiety and there are at most two carbonyl moieties present in the ring;

(ad) C_2–C_4 alkenyl radical, optionally monosubstituted by one of (1) the substituents (a) to (ac) above; or (2) phenyl, pyridyl, quinoline, or isoquinoline, each of which is optionally monosubstituted by R^q as defined above;

(ae) C_2–C_4 alkynyl radical, optionally monosubstituted by one of the substituents (a) to (ac) above;

(af) C_1–C_4 alkyl radical;

(ag) C_1–C_4 alkyl mono-substituted by one of the substituents (a)–(ac) above;

(ah) a 2-oxazolidinonyl moiety in which the point of attachment is the nitrogen atom of the oxazolidinone ring, the ring oxygen atom is optionally replaced by a heteroatom selected from S and NR^t (where R^t is as defined above) and one of the saturated carbon atoms of the oxazolidinone ring is optionally mono-substituted by one of the substituents (a) to (ag) above;

M is selected from:

(i) hydrogen;

(ii) a pharmaceutically acceptable esterifying group or removable carboxyl protecting group; or

(iii) an alkali metal or other pharmaceutically acceptable cation.

5,025,009

NOVEL BENZAZEPINE DERIVATIVES

Frederik Gronwald, Vedbaek; Peter H. Andersen; Peter Faarup, both of Vaerlose; Erling Guddal, Brondby; Kristian T. Hansen, Copenhagen; Louis B. Hansen, and Erik B. Nielsen, both of Vaerlose, all of Denmark, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark

Division of Ser. No. 365,250, Jun. 12, 1989. This application Feb. 7, 1990, Ser. No. 477,450

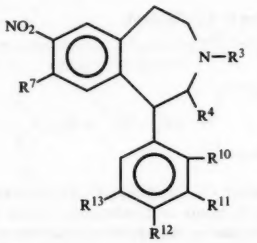
Claims priority, application Denmark, Jun. 15, 1988, 3251/88

Int. Cl.[5] **C07D** *223/14, 491/048, 491/052;* **A61K** *31/55*

U.S. Cl. 514—213 **17 Claims**

1. A 2,3,4,5-tetrahydro-1H-3-benzazepine of the formula I

(I)



wherein R^3 represents H, C_{1-3}-alkyl or C_{3-7}-cycloalkyl; R^4 together with R^{10} represents a bridge which connects the positions to which R^4 and R^{10} are linked, said bridge being $-CH_2-CH_2-$, $-CH=CH-$, $-O-CH_2-$, or $-S-CH_2-$ with the proviso that, when the bridge contains a heteroatom, the bridge member linked to the benzazepine nucleus is always a carbon atom;

R^7 represents hydroxy or lower alkoxy;

R^{11} and R^{12} independently represent hydrogen, halogen, alkoxy, or alkyl, or R^{11} together with R^{12} represents a bridge, the bridge being chosen from among $-O-CH_2-CH-$, $-O-CH_2-CH_2-CH_2-$, $-O-CH=CH-$, $-CH_2-CH_2-CH_2-$, $-CH_2-CH=CH-$ or $-CH_2-CH_2-CH_2-CH_2-$; and wherein

R^{13} represents hydrogen, halogen, or lower alkyl, and pharmaceutically-acceptable acid addition salts.

8. A pharmaceutical composition useful for treating CNS ailments containing an effective amount of a benzazepine of claim 1 or a pharmaceutically-acceptable acid addition salt thereof.

5,025,010

BENZOTHIAZINONE DERIVATIVES, AND PHARMACEUTICALS CONTAINING THEM

Raymond Oekonomopulos, Wiesbaden; Rainer Henning, Hattersheim am Main; Ulrich Lerch, Hofheim am Taunus; Bernward Schölkens, and Wolfgang Linz, both of Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 222,607, Jul. 21, 1988, abandoned. This application Oct. 17, 1989, Ser. No. 423,714

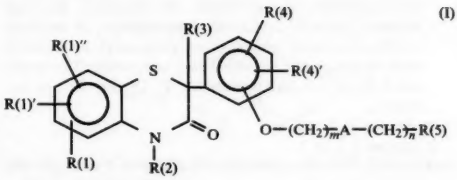
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1987, 3724366

Int. Cl.[5] **C07D** *279/16;* **A61K** *31/54*

U.S. Cl. 514—224.2 **8 Claims**

1. A compound I of the formula

(I)



in which formula I:

R(1), R(1)′ and R(1)″ are identical or different and denote, independently of one another, hydrogen, (C_1-C_4)-alkyl, (C_1-C_3)-alkoxy, F, Cl, Br, CF_3, nitro, hydroxyl, acetamido or amino,

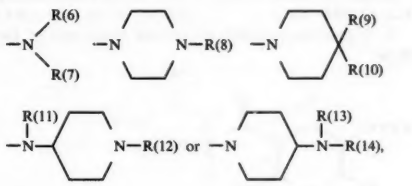
R(2) denotes hydrogen, (C_1-C_{10})-alkyl, straight-chain or branched, (C_3-C_{10})-alkenyl, straight-chain or branched, phenyl-(C_1-C_4)-alkyl, the phenyl ring being unsubstituted or substituted by one, two or three substituents from the group comprising (C_1-C_4)-alkyl, (C_1-C_3)-alkoxy, F, Cl, CF_3, (C_1-C_2)-alkylenedioxy or nitro,

R(3) denotes hydrogen, (C_1-C_{15})-alkyl, straight-chain or branched, (C_3-C_{15})-alkenyl, straight-chain or branched, C_4-C_8)-cycloalkyl, C_4-C_8)-cycloalkyl-(C_1-C_4)-alkyl, phenyl or phenyl-(C_1-C_4)-alkyl, each of the phenyl radicals being unsubstituted or substituted by one, two or three substituents from the group comprising (C_1-C_4)-alkyl, (C_1-C_3)-alkoxy, F, Cl, CF_3, (C_1-C_2)-alkylenedioxy or nitro,

R(4) and R(4)′ are identical or different and denote, independently of one another, hydrogen, (C_1-C_4)alkyl, (C_1-C_3)-alkoxy, F, Cl, CF_3, nitro, hydroxyl, acetamido or amino,

A denotes a group $-C\equiv C-$ or a group $-CH=CH-$ which has the cis or trans configuration,

R(5) denotes one of the following groups



in which

R(6) and R(7) are identical or different and denote, independently of one another, hydrogen, (C_1-C_{10})alkyl, C_4-C_8)-cycloalkyl, C_4-C_8)-cycloalkyl-(C_1-C_4)-alkyl, pyridyl-(C_1-C_4)-alkyl, phenyl-(C_1-C_6)alkyl, benzhydryl or benzhydryl-(C_1-C_4)-alkyl, each of the phenyl radicals being unsubstituted or substituted by one, two or three radicals from the group comprising (C_1-C_4)-alkyl, (C_1-C_4)-alkoxy, (C_1-C_2)-alkylenedioxy, F, Cl, Br, CF_3 or hydroxyl,

R(8) denotes hydrogen, (C_1-C_{10})-alkyl, straight-chain or branched, C_1-C_8)-alkanoyl, pyridyl, pyrimidinyl, phenyl, phenyl-(C_1-C_4)-alkyl, phenyl-(C_3-C_5)alkenyl, benzhydryl or benzhydryl-(C_1-C_4)-alkyl, phenyl-(C_1-C_4)-alkanoyl or benzoyl, each of the phenyl radicals being unsubstituted or substituted by one, two or three radicals from the group comprising (C_1-C_4)-alkyl, (C_1-C_4)-alkoxy, (C_1-C_2)-alkylenedioxy, F, Cl, Br, CF_3 or hydroxyl,

R(9) denotes hydrogen, (C_1-C_{10})-alkyl, phenyl, phenyl-(C_1-C_4)-alkyl, each of the phenyl radicals be unsubstituted or substituted by one, two or three radicals from the group comprising (C_1-C_4)-alkyl, (C_1-C_4)-alkoxy, (C_1-C_2)-alkylenedioxy, F, Cl, Br, CF_3 or hydroxyl,

R(10) denotes hydrogen, hydroxyl or (C_1-C_4)-alkoxy, and

R(11) and R(12) or R(13) and R(14) are identical or different

and denote, independently of one another, hydrogen, (C_1–C_{10})-alkyl, straight-chain or branched, (C_1–C_6)-alkanoyl, phenyl-(C_1–C_4)-alkyl, benzhydryl, or benzhydryl-(C_1–C_4)-alkyl, phenyl-(C_1–C_4)-alkanoyl or benzoyl, each of the phenyl radicals being unsubstituted or substituted by (C_1–C_2)-alkylenedioxy, F, Cl, Br, CF_3 or hydroxyl,

m denotes 1, 2 or 3, and

n denotes 1, 2 or 3,

and the salts of the compounds of the formula I with pharmaceutically acceptable acids.

4. A pharmaceutical composition effective in the treatment of disorders of the cardiovascular system or disturbances of the blood glucose balance which comprises an effective amount of at least one compound as claimed in claim 1 in a pharmaceutically acceptable carrier.

5,025,011

FUSED PYRIDINES ACTIVE ON THE CARDIOVASCULAR SYSTEM

Cesare Casagrande, Arese; Stefania Montanari, and Francesco Santangelo, both of Milan, all of Italy, assignors to SIMES, Societa Italiana Medicinali e Sintetici S.p.A., Vicenza, Italy

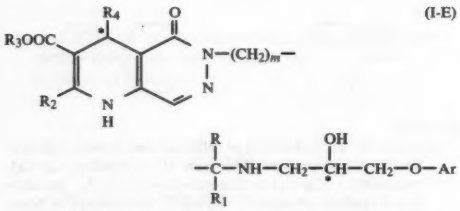
Filed Jul. 25, 1989, Ser. No. 390,018

Claims priority, application Italy, Jul. 29, 1988, 21544 A/88

Int. Cl.[5] A61K *31/435, 31/495, 31/50;* **C07D** *471/04*

U.S. Cl. 514—234.2 **4 Claims**

1. A pharmacologically-acceptable compound of the formula:



(I-E)

wherein Ar is a member selected from the group consisting of 2-methoxyphenyl, 2-allyloxyphenyl, 2-cyanophenyl, 2-methylphenyl, 2-allylphenyl, carbamoylmethylphenyl, 4-hydroxyphenyl, 4-morpholino-1,2,5-thiadiazol-3-yl, indol-4-yl and 3,4-dihydro- 1(H)-carbostyrl-5-yl;

each of R and R_1 is, independently, hydrogen or methyl, R_2 is methyl, R_3 is methyl, ethyl or isopropyl; R_4 is optionally-substituted phenyl any substituent of which is a member selected from the group consisting of halogen, hydroxy, C_1–C_5 alkyl, C_2–C_5 alkenyl, C_1–C_3 alkoxy, C_2–C_5 alkenyloxy, alkoxyalkyl having from 1 to 5 carbon atoms both in the alkyl and alkoxy moiety, C_2–C_5 alkanoyl, trifluoromethyl, amino, nitro, carbamoyl, cyano, C_1–C_3 alkylthio, carbamoyl (C_1–C_6) alkyl and C_1–C_6 alkanoylamino, m is 1; and

the asterisks denote asymmetric carbon atoms; or a salt thereof with a pharmaceutically-acceptable organic or inorganic acid.

5,025,012

NICOTINIC ACID DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS COMPRISING SAME

Katsutoshi Miura; Hiroyasu Koyama; Toshiji Sugai; Hiroaki Yamada, and Einosuke Sakurai, all of Saitama, Japan, assignors to Nisshin Flour Milling Co., Ltd., Tokyo, Japan

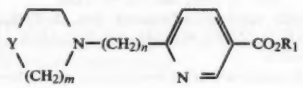
Filed Feb. 22, 1990, Ser. No. 484,130

Claims priority, application Japan, Mar. 1, 1989, 1-46647

Int. Cl.[5] A61K *31/495, 31/44, 31/445;* **C07D** *410/04*

U.S. Cl. 514—252 **12 Claims**

1. A compound of formula (I)

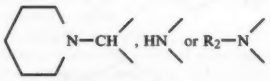


(I)

wherein

R_1 is hydrogen or C_1–C_6 alkyl;

Y is —CH_2—, —O—,



R_2 is C_1–C_6 alkyl; C_2–C_6 alkenyl; C_3–C_6 cycloalkyl; phenyl which may be mono- or di-substituted on the phenyl ring with C_1–C_6 alkoxy; aralkyl which may be mono- or di-substituted on the aromatic ring with C_1–C_6 alkoxy; diphenylmethyl; carbo(C_1–C_2) alkoxy; or furanyl or pyrrolidinyl which is linked to the nitrogen atom via carbonyl or carbonylmethylene;

m is 2 or 3;

and n is 0 or 1, or a physiologically acceptable salt thereof.

7. A pharmaceutical composition having a blood flow-increasing action which comprises a therapeutically effective amount of a compound of claim 1 or a physiologically acceptable salt thereof and a pharmaceutically acceptable carrier.

5,025,013

BENZOPYRAN DERIVATIVES, THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Michel Barreau, Montgeron; Jean-Claude Hardy, Cergy Pontoise; Jean-Paul Martin, Colombes, and Christian Renault, Taverny, all of France, assignors to Rhone-Poulenc Sante, Antony, France

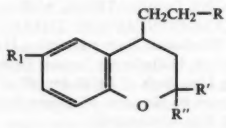
Filed Jan. 16, 1990, Ser. No. 465,330

Claims priority, application France, Jan. 20, 1989, 89 00657

Int. Cl.[5] A61K *31/495, 31/445;* **C07D** *407/06*

U.S. Cl. 514—253 **8 Claims**

1. A benzopyran compound having the formula:

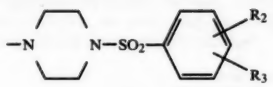


wherein

R_1 represents a hydrogen or halogen atom or a hydroxy, alkyloxy, nitro, amino, alkylsulphonamido or acylamino radical,

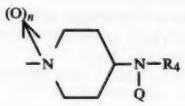
R represents

(1) a radical of formula:

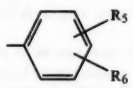


wherein R_2 and R_3, which may be identical or different, represent hydrogen or halogen atoms or hydroxy, alkyl, alkyloxy, amino, alkylsulphonamido or nitro radicals, or alternatively

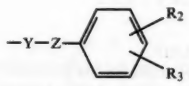
(2) a radical of formula:



wherein n equals 0 or 1, R_4 is a hydrogen atom, an alkyl radical or a radical of structure:

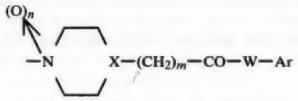


wherein R_5 and R_6 are hydrogen or halogen atoms or an alkyloxy radical, and Q represents an acyl or alkylsulphonyl radical or a radical of structure:



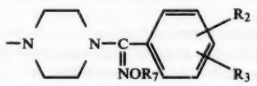
wherein R_2 and R_3 are defined as above, Y represents a carbonyl or sulphonyl radical and Z represents a single bond or a methylene or imino radical, or alternatively

(3) a radical of formula:



wherein n equals 0 or 1, m equals 0 to 2, X is a carbon atom or X can be a nitrogen atom if n=0, W represents a single bond or an imino radical and Ar represents a pyridyl, indolyl, quinolyl or 2-alkylquinolyl radical or a phenyl radical optionally substituted with radicals R_2 and R_3 as defined above, provided that m is other than 0 when X is a nitrogen atom, or alternatively

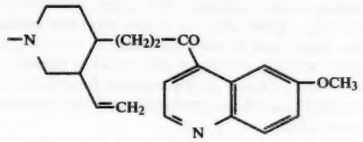
(4) a radical of formula:



(VI)

wherein R_2 and R_3 are defined as above and R_7 denotes a hydrogen atom or an alkyl radical, or alternatively

(5) a radical of formula:



and R′ and R″, which are identical, represent hydrogen atoms or alkyl radicals,

on the understanding that the alkyl and acyl radicals and portion mentioned above contain 1 to 4 carbon atoms in a straight or branched chain, in its isomeric forms and the mixtures thereof, as well as its pharmaceutically acceptable addition salts with acids.

8. A pharmaceutical composition, which comprises an effective amount benzopyran compound according to claim 1, in the pure state or in the form of a combination with one or more compatible and pharmaceutically acceptable adjuvants or diluents.

5,025,014

BICYCLIC HETEROCYCLYL CONTAINING N-(BICYCLIC HETEROCYCLYL)-4-PIPERIDINAMINES AS PHARMACEUTICALS

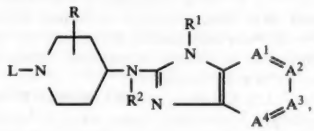
Frans E. Janssens, Bonheiden; Joseph L. G. Torremans, Beerse; Jozef F. Hens, Nijlen; and Theophilus T. J. M. Van Offenwert, Vosselaar, all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Division of Ser. No. 56,200, Jun. 1, 1987, Pat. No. 4,888,426, which is a division of Ser. No. 660,608, Oct. 12, 1987, Pat. No. 4,695,569, which is a continuation-in-part of Ser. No. 556,742, Nov. 30, 1988, abandoned. This application Dec. 7, 1989, Ser. No. 447,312

Int. Cl.[5] **A61K** *31/505, 31/52;* **C07D** *487/04, 473/04*

U.S. Cl. 514—258 **18 Claims**

1. A compound of the formula:



(I)

a pharmaceutically acceptable acid addition salt or a possible stereochemically isomeric form thereof, wherein:

$A^1{=}A^2{-}A^3{=}A^4$ represents a bivalent radical of the formula:

—CH=CH—CH=CH— (a);

—N=CH—CH=CH— (b);

—CH=N—CH=CH— (c);

—CH=CH—N=CH— (d);ps

or

—CH=CH—CH=N— (e),

wherein one or two hydrogen atoms in said radicals (a)–(e) may, each independently from each other, be replaced by halo, lower alkyl, lower alkyloxy, trifluoromethyl or hydroxy;

R represents a member selected from the group consisting of hydrogen and lower alkyl;

R^1 represents a member selected from the group consisting of hydrogen, alkyl, cycloalkyl, Ar^1 and lower alkyl substituted with one or two Ar^1 radicals, wherein:

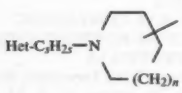
Ar^1 represents a member selected from the group consisting of phenyl, being optionally substituted with up to three substituents, each independently selected from the group

consisting of halo, hydroxy, nitro, cyano, trifluoromethyl, lower alkyl, lower alkyloxy, lower alkylthio, mercapto, amino, mono- and di(lower alkyl)amino, carboxyl, lower alkyloxycarbonyl and lower alkyl—CO—; thienyl; halothienyl; furanyl; lower alkyl substituted furanyl; pyridinyl; pyrazinyl; thiazolyl; and imidazolyl optionally substituted by lower alkyl;

R^2 represents a member selected from the group consisting of hydrogen, lower alkyl, cycloalkyl, (lower alkyl)—CO—, lower alkyl—O—(CO)— and Ar^2-lower alkyl, wherein;

Ar^2 represents a member selected from the group consisting of phenyl being optionally substituted with up to three substituents each independently selected from the group consisting of halo, hydroxy, nitro, cyano, trifluoromethyl, lower alkyl, lower alkyloxy, lower alkylthio, mercapto, amino, mono- and di(lower alkyl)amino, carboxyl, lower alkyloxycarbonyl, and (lower alkyl)—CO; and

L represents a member selected from the group consisting of radicals of the formula:



(f)

Het-C_sH_{2s}—Y-Alk-; and (g)

Het-C_sH_{2s}—Z—(C=X)—Y-Alk-, (h)

wherein:

n represents a number having a value of from 0 to 2;

s represents a number having a value of from 0 to 6;

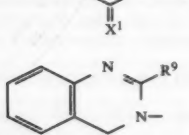
Alk represents lower alkanediyl;

Y represents O, S, NR^3, or a direct bond, wherein R^3 represents hydrogen, lower alkyl, (Ar^2) lower alkyl, 2-lower alkyloxy-1,2-dioxoethyl or a radical of formula —C(=X)—R^6, R^6 being hydrogen, lower alkyl, Ar^2, Ar^2-lower alkyl, lower alkyloxy, Ar^2-lower alkyloxy, mono- or di(lower alkyl)amino, Ar^2-amino, Ar^2-lower alkylamino, or Ar^2-lower alkyl(lower alkyl)amino, wherein Ar^2 is as defined above;

X represents O, S, CH-NO_2, or NR^4, wherein R^4 represents hydrogen, lower alkyl, cyano, nitro, Ar^2-sulfonyl, lower alkylsulfonyl, lower alkylcarbonyl, or Ar^2-carbonyl wherein Ar^2 is as defined above;

Z represents O, S, NR^5, or a direct bond wherein R^5 represents hydrogen or lower alkyl; and

Het represents a member of the group consisting of a radical of the formula:

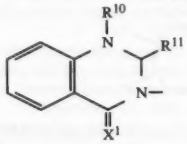


(i-1)

(i-2)

and

-continued



(i-3)

wherein:

each X^1 independently represents O or S;

R^7, R^8, and R^{10} are each independently hydrogen, lower alkyl, Ar^2-lower alkyl wherein Ar^2 is as defined above, hydroxylower alkyl, or lower alkyloxycarbonyl;

R^9 and R^{11} are each independently hydrogen, lower alkyl, hydroxy, mercapto, lower alkyloxy, lower alkylthio, halo, and (lower alkyloxycarbonyl)lower alkyl;

B^1 represents —CH=CH—CH=CH—, —S—CH=CH—, or —N=CH—NH—;

wherein one or two hydrogen atoms in said radical B^1 or in the benzene part of the radicals of formula (i-2) or (i-3) may be replaced by lower alkyl, lower alkylthio, lower alkyloxy, or halo where said hydrogen atom is bonded on a carbon atom, or by lower alkyl, lower alkyloxycarbonyl, Ar^2-lower alkyl wherein Ar^2 is as defined above, where said hydrogen is bonded on a nitrogen atom,

provided that the group R^7 or R^8, as the case may be, is absent where the radical of formula (i-1) is connected to C_sH_{2s} on the nitrogen atom bearing R^7 or R^8 in the formula, and further provided that (a) when L represents a radical either of formula (f) or of formula (g) wherein Y represents other than a direct bond, or (b) when L represents a radical of formula (h) wherein Z represents other than a direct bond, wherein in said radicals (f), (g), or (h) Het is connected to C_sH_{2s} on a nitrogen atom, then s is not 0.

5,025,015

THIOFORMAMIDINES, AND USE AS MEDICAMENTS

Jean F. Patoiseau, Castres; Jean-Marie Autin, Labruguiere; Henri Cousse, Castres; Véronique Sales, Dijon; Jacky Tisne-Versailles, Castres, and Jean-Pierre Bali, Montpellier Cédex, all of France, assignors to Pierre Fabre Medicament, Paris, France

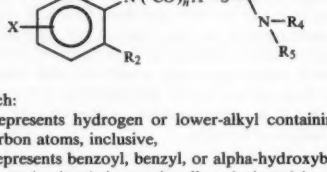
Filed Sep. 7, 1989, Ser. No. 404,337

Claims priority, application France, Sep. 8, 1988, 88 11747

Int. Cl.[5] **A61K** *31/505, 31/415, 31/41;* **C07D** *239/38*

U.S. Cl. 514—274 **6 Claims**

1. A thioformamidine selected from those having formula I:



(I)

in which:

R_1 represents hydrogen or lower-alkyl containing 1 to 4 carbon atoms, inclusive,

R_2 represents benzoyl, benzyl, or alpha-hydroxybenzyl, the aromatic ring being optionally substituted by a halogen atom,

R_3 and R_4 form with the formamidine function a heterocycle selected from imidazole, imidazoline, benzimidazole, triazole, pyrimidine, and tetrahydropyrimidine;

R_5 represents hydrogen or lower-alkyl containing 1 to 4 carbon atoms, inclusive, or forms with R_4 a double bond (—N=R_4) in the case of a pseudoaromatic heterocycle;

n equals 0 or 1;

A represents a linear or branched alkylene group having 1 to 4 carbon atoms, inclusive,

X represents hydrogen, halogen, lower C_{1-4} alkyl, lower C_{1-4} alkoxy, or nitro, and pharmaceuticallyacceptable organic and inorganic salts thereof.

5,025,016

PYRIMIDINE-THIOALKYL PYRIDINE DERIVATIVES, MEDICAMENTS CONTAINING THESE COMPOUNDS, AND METHOD OF TREATMENT

Kurt H. Ahrens, Nuremberg; Helmut Schickaneder, Eckental; Heidrun Engler, Cadolzburg, and Istvan Szeleny, Schwaig, all of Fed. Rep. of Germany, assignors to Ludwig Heumann & Co. GmbH, Nuremberg, Fed. Rep. of Germany

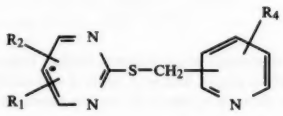
Division of Ser. No. 16,564, Feb. 19, 1987, abandoned, which is a continuation of Ser. No. 605,926, May 1, 1984, abandoned. This application Sep. 26, 1988, Ser. No. 248,927

Claims priority, application Fed. Rep. of Germany, May 5, 1983, 83104452[U]

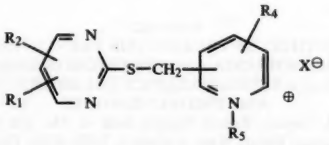
Int. Cl.[5] **A61K** *31/505;* **C07D** *401/00, 403/00, 239/02*

U.S. Cl. 514—274 **32 Claims**

1. A pyrimidine-thioalkyl pyridine compound having the formula



or the formula



wherein R_1, R_2 and R_4 are the same or different and are selected from the group consisting of hydrogen, lower alkyl, halogen, amino and hydroxy with the proviso that at least one of R_1 or R_2 is amino or hydroxy, R_5 is a lower alkyl group, X is a halogen atom, the pyrimidine-thioalkyl group being bonded in the 2-, 3- or 4-position of the pyridine ring, or a pharmaceutically acceptable salt thereof.

32. A bronchosecretolytic or mucolytic composition of matter, comprising (i) a bronchosectetolytically or mucoltyically effective amount of a pyrimidine-thioalkyl pyridine compound as defined in claim 1, or a pharmaceutically effective salt thereof, and (ii) a pharmaceutically acceptable carrier or diluent thereof.

5,025,017

SECO-MEVINIC ACID DERIVATIVES USEFUL AS ANTIHYPERCHOLESTEROLEMIC AGENTS AND NEW INTERMEDIATES

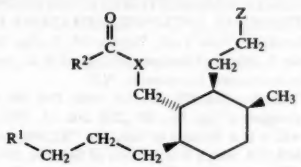
Donald S. Karanewsky, Robbinsville, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

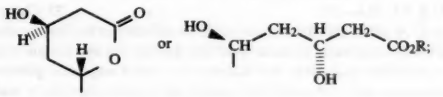
Filed Sep. 28, 1989, Ser. No. 413,656

Int. Cl.[5] **A61K** *31/435*

U.S. Cl. 514—277 **22 Claims**

1. A compound having the structure





R is H, lower alkyl or metal ion;

R^1 is H, lower alkyl, aryl, lower alkoxy, cycloalkyl, aralkyl, heterocyclicalkyl or heterocyclic;

R^2 is lower alkyl, cycloalkyl or aralkyl;

X is O or NR^5, wherein R^5 is H or lower alkyl; wherein the term heterocyclic by itself or as part of another group represents a 5 to 10 membered monocyclic or bicyclic ring containing one or two heteroatoms which are N, S or O, wherein the term lower alkyl or alkyl by itself or as part of another group contains 1 to 12 carbons and is unsubstituted or substituted with a halo-substituent, trifluoromethyl, alkoxy, aryl, alkylaryl, haloaryl, cycloalkyl, alkylcycloalkyl, hydroxy, alkoxycarbonyl, alkanoyloxy, aroyloxy, alkylthio, alkylsulfinyl, alkylsulfonyl, arythio, arylsulfinyl and/or arylsulfonyl; the term cycloalkyl by itself or as part of another group contains 3 to 12 carbons and is unsubstituted or substituted with 1or 2 halogen, lower alkyl, hydroxy, lower alkoxycarbonyl, lower alkanoyl, aroyl, aryl, alkylthio, alkylsulfinyl, alkylsulfonyl, cycloalkylthio, cycloalkylsulfinyl, cycloalkylsulfonyl, arylthio and/or oxo groups; the term aryl by itself or as part of another group refers to monocyclic or bicyclic aromatic groups containing 6 to 10 carbons in the ring portion and is unsubstituted or substituted with 1 or 2 lower alkyl, halogen, trifluoromethyl, lower alkoxy, nitro and/or cyano groups.

5,025,018

CENTRAL NERVOUS SYSTEM INJURY TREATMENT WITH OPIATE-RECEPTOR ANTAGONIST

Alan I. Faden, Mill Valley, Calif., assignor to Medicis Corporation, New York, N.Y.

Continuation of Ser. No. 456,235, Dec. 27, 1989, abandoned, which is a continuation of Ser. No. 287,685, Dec. 20, 1988, abandoned, which is a continuation of Ser. No. 58,340, Jun. 5, 1987, abandoned. This application Aug. 22, 1990, Ser. No. 571,019

Int. Cl.[5] **A61K** *31/435, 31/44*

U.S. Cl. 514—277 **6 Claims**

1. A method of inducing kappa-opiate-receptor antagonistic activity in a patient suffering from ischemic or traumatic central nervous system injury which comprises administering to said patient an effective amount of a kappa-opiate-receptor antagonist suitable to permit the induction of kappa-opiate receptor antagonistic activity.

5,025,019

COUGH/COLD MIXTURES COMPRISING NON-STEROIDAL ANTI-INFLAMMATORY DRUGS

Abraham Sunshine, New York; Eugene M. Laska, Larchmont, and Carole E. Siegel, Mamaroneck, all of N.Y., assignors to Analgesic Associates, Larchmont, N.Y.

Division of Ser. No. 144,099, Jan. 15, 1988, Pat. No. 4,920,149, which is a division of Ser. No. 887,205, Jul. 21, 1986, Pat. No. 4,738,966, which is a division of Ser. No. 752,546, Jul. 8, 1985, Pat. No. 4,619,934, which is a division of Ser. No. 598,502, Apr. 9, 1984, Pat. No. 4,552,899. This application Nov. 20, 1989, Ser. No. 438,074

Int. Cl.[5] A61K *31/19, 31/44, 31/435, 31/445*

U.S. Cl. 514—277 **23 Claims**

1. A pharmaceutical composition of matter for use in the treatment of cough, cold, cold-like and/or flu symptoms in a mammalian organism, and adapted for unit dosage oral administration, said composition comprising (i) an analgesically and anti-inflammatoryily effective amount of a non-narcotic constituent consisting essentially of at least one of propionic acid NSAID s, ibuprofen, naproxen benoxaprofen, fluribiprofen, fenoprofen, fenbufen, ketoprofen, indoprofen, pirprofen, carprofen, oxaprozin, pranoprofen, miroprofen, tioxaprofen, suprofen, alminoprofen, tiaprofenic acid, fluprofen, bucloxic acid, or pharmaceutically acceptable salt thereof, in combinatory immixture with (ii) a sympathomimetically effective amount of at least one of the sympathomimetic amines, pseudoephedrine, phenylpropanolamine, phenylephrine, or pharmaceutically acceptable salt thereof, and (iii) an antihistaminically effective amount of at least one of the antihistamines, chlorpheniramine, brompheniramine, dexchlorpheniramine, dexbrompheniramine, triprolidine, doxylamine, tripelennamine, cyproheptadine, carbinoxamine, bromodiphenhydramine, phenindamine, pyrilamine, azatadine, or pharmaceutically acceptable salt thereof.

5,025,020

USE OF TETRANDRINE AND ITS DERIVATIVES TO TREAT MALARIA

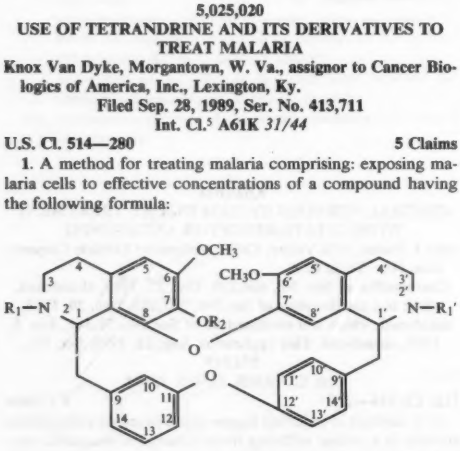
Knox Van Dyke, Morgantown, W. Va., assignor to Cancer Biologics of America, Inc., Lexington, Ky.

Filed Sep. 28, 1989, Ser. No. 413,711

Int. Cl.[5] A61K *31/44*

U.S. Cl. 514—280 **5 Claims**

1. A method for treating malaria comprising: exposing malaria cells to effective concentrations of a compound having the following formula:



where R_1 and R_1' are the same or different shortchaned carbon based ligand; and R_2 and R_3 are the same or different CH_3 or hydrogen.

5,025,021

1,2-DIDEOXY-2-FLUORONOJIRIMYCIN AS GLYCOSIDASE INHIBITORS

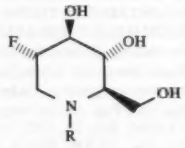
Daniel P. Getman, St. Louis, and Gary A. DeCrescenzo, St. Peters, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Jul. 27, 1989, Ser. No. 386,538

Int. Cl.[5] A61K *31/445;* **C07D** *211/46, 491/056*

U.S. Cl. 514—302 **19 Claims**

1. Compound represented by the formula:



wherein R represents hydrogen, alkyl radicals having from 1 to about 10 carbon atoms, alkenyl radicals having from 2 to about 10 carbon atoms, aryl, alkaryl and aralkyl radicals having from about 6 to about 16 carbon atoms and radicals represented by the formula:

wherein R' represents alkyl radicals, having from about 1 to about 10 carbon atoms, and aryl, aralkyl and alkaryl radicals having from about 6 to about 26 carbon atoms, A represents oxygen, and n is 0 or 1.

5,025,022

METHOD OF TREATING OR PREVENTING SCHIZOPHRENIA AND/OR PSYCHOSIS USING S-N-(1-AZABICYCLO[2.2.2]OCT-3-YL)BENZAMIDES AND THIOBENZAMIDES

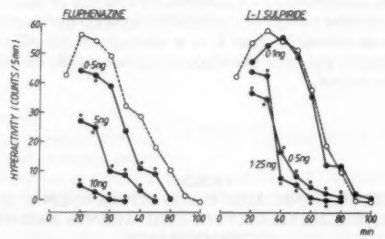
Robert J. Naylor; Brenda Naylor, both of The Old Rectory, Addingham, Ilkley, West Yorkshire, LS29 0QP, Great Britain; Alain Renaud, 16, Place des Arts, 92500 Rueil Malmaison, and Michel Langlois, 4, Place Cesar Franck, 78530 Buc, both of France

Filed Aug. 3, 1989, Ser. No. 389,364

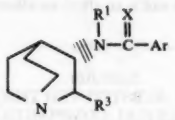
Claims priority, application European Pat. Off., Aug. 4, 1988, 88402042.1

Int. Cl.[5] A61K *31/44, 31/495, 31/50*

U.S. Cl. 514—305 **4 Claims**



1. A method for treating or preventing schizophrenia and/or psychosis, the method comprising the administration to a mammal in need of antischizophrenic and/or antipsychotic treatment an effective amount of a compound of general formula I



(I)

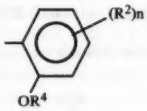
wherein:

X represents oxygen or sulphur;

each of R^1 and R^3 independently represents hydrogen or a C_4–C_4 alkyl group;

Ar represents

a phenyl ring optionally substituted by one, two or three C_1–C_4 alkoxy groups and/or by one or two halogen atoms; a phenyl ring of the general formula

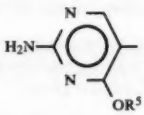


wherein R^2 represents halogen, 4-5-benzo, C_1–C_8 alkoxy, C_1–C_4 alkylcarbonyl or Am, wherein Am represents amino, methylamino or dimethylamino,

R^4 represents C_1–C_8 alkyl,

n is 1 or 2; or

a pyrimidinyl moiety of the general formula



wherein R_5 is C_1–C_4 alkyl;

or an N-oxide and/or pharmaceutically acceptable salt thereof.

5,025,023

PEPTIDE ANTIBIOTICS

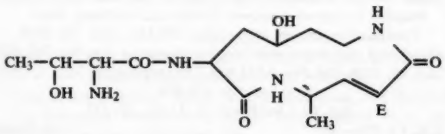
Masataka Konishi, Kawasaki; Koji Tomita, Setagaya; Masahisa Oka, Yokohama, and Ken-ichi Numata, Fuchu, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 309,527, Feb. 13, 1989, Pat. No. 4,898,940, which is a division of Ser. No. 51,433, May 19, 1987, Pat. No. 4,833,076, which is a continuation-in-part of Ser. No. 771,090, Aug. 30, 1985, abandoned. This application Sep. 29, 1989, Ser. No. 414,357

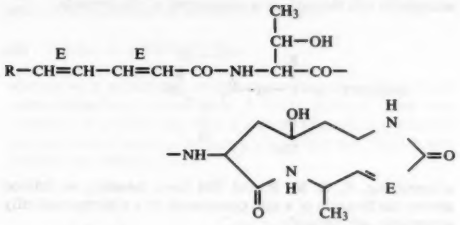
Int. Cl.[5] A61K *31/395;* **C07D** *245/02*

U.S. Cl. 514—183 **2 Claims**

1. The compound of the formula



2. A composition comprising an amount effective as an antifungal or antitumor agent of at least one compound of the formula:



wherein R is $CH_3(CH_2)_6$, CH_3—$(CH_2)_4$—CH=CH—$(CH_2)_2$ or CH_3—$(CH_2)_8$, together with a pharmaceutically acceptable carrier.

5,025,024

THERAPEUTICALLY ACTIVE FLUORO-SUBSTITUTED COMPOUND

Arne E. Bränström, Göthenburg; Per L. Lindberg, Askim, and Gunnel E. Sunden, Göthenburg, all of Sweden, assignors to Aktiebolaget Hässle, Södertalje, Sweden

Filed Dec. 20, 1989, Ser. No. 453,960

Claims priority, application Sweden, Dec. 22, 1988, 8804629; Jun. 16, 1989, 8902170

Int. Cl.[5] A61K *31/44;* **C07D** *213/68*

U.S. Cl. 514—338 **7 Claims**

1. 4-Fluoro-2-[[(4-methoxy-2-pyridinyl)methyl]sulfinyl]-1H-benzimidazole or physiologically acceptable salts thereof, or its optical enantiomers.

5. A pharmaceutical composition containing as active ingredient an effective amount of the compound according to claim 1 and a pharmaceutically acceptable carrier.

5,025,025

(ARYLSULFONAMIDO- AND PYRIDYL-)-SUBSTITUTED CARBOXYLIC ACIDS AND DERIVATIVES THEREOF AND USE FOR SUPPRESSING THROMBOXANE ACTIVITY

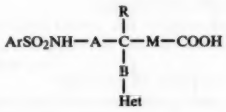
Shripad S. Bhagwat, Scotch Plains; Alan J. Main, Basking Ridge, both of N.J., and Herman R. Rodriguez, New York, N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 373,125, Jun. 28, 1989. This application May 23, 1990, Ser. No. 528,018

Int. Cl.[5] C07D *401/06, 401/12, 213/28;* **A61K** *31/41, 31/44*

U.S. Cl. 514—340 **60 Claims**

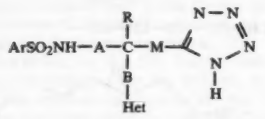
1. A compound of the formula



(I)

wherein A represents lower alkylene; B represents oxygen, sulfur, lower alkylene, lower alkylene interrupted by oxygen, sulfur, sulfinyl or sulfonyl, (oxy-, sulfinyl-, sulfonyl- or thio)-lower alkylene, lower alkenylene, phenylene or a direct bond; M represents lower alkylene, lower alkylene interrupted by oxygen, sulfur, sulfinyl or sulfonyl, (oxy-, sulfinyl, sulfonyl- or thio)-lower alkylene, lower alkenylene or a direct bond; or one of A, B and M represents hydrogen unless A, B or M represents lower alkylidenylene in which case R represents the second bond to the adjacent alkylidenylene unsaturated carbon atom; Het represents 3-pyridyl, or 3-pyridyl substituted by lower alkyl; Ar represents carbocyclic aryl; a pharmaceuitically acceptable ester or amide derivative thereof wherein carboxy is esterified in form of a pharmaceutically acceptable ester or carboxy is derivatized in form of a pharmaceutically

acceptable amide; the N-oxide thereof; or a pharmaceutically acceptable salt thereof; or a compound of the formula



wherein Ar, A, B, M, R and Het have meaning as defined above; the N-oxide of a said compound; or a pharmaceutically acceptable salt thereof.

47. A method of suppressing thromboxane activity in mammals which comprises administering to a mammal in need thereof an effective thromboxane suppressing amount of a compound according to claim 1.

5,025,026

HAIR RESTORER

Nakaguchi Osamu, Toyonaka, Japan, assignor to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

PCT No. PCT/JP88/01289, § 371 Date Aug. 21, 1989, § 102(e) Date Aug. 21, 1989, PCT Pub. No. WO89/05626, PCT Pub. Date Jun. 29, 1989

PCT Filed Dec. 21, 1988, Ser. No. 400,118

Claims priority, application Japan, Dec. 24, 1987, 62-329227

Int. Cl.[5] A61K *31/425*

U.S. Cl. 514—356 **1 Claim**

1. A method of restoring hair in a subject in need thereof, which comprises administering to the subject an effective amount of n-pentadecyl nicotinate.

5,025,027

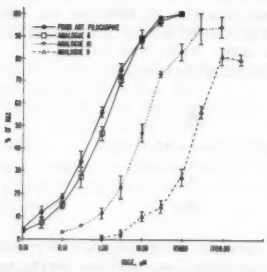
CYCLIC CARBAMATE ANALOGUES OF (+)-PILOCARPINE

Henry Rapoport, Berkeley, Calif., and Per Sauerberg, Valby, Denmark, assignors to Regents of the University of California, Berkeley, Calif.

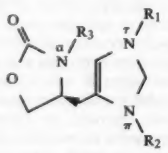
Continuation-in-part of Ser. No. 317,760, Mar. 2, 1989, abandoned. This application Dec. 5, 1989, Ser. No. 446,486

Int. Cl.[5] A61K *31/42*; C07D *263/04*

U.S. Cl. 514—376 **6 Claims**



1. A biologically active compound having the structure



wherein R_1 or R_2 has less than about 12 carbon atoms and is a primary or secondary alkyl, a primary or secondary aralkyl or a cycloaklkyl and R_3 has from at least two carbon atoms to about 8 carbon atoms and is an alkyl, an alkenyl, an alkynyl or a cycloalkyl.

5,025,028

TETRAZOLYL SUBSTITUTED THIOETHERS, PHARMACEUTICAL COMPOSITIONS AND ANTI-ALLERGIC USE THEREOF

Erhard Reinholz; Walter-Gunar Friebe, both of Mannheim; Wolfgang Kampe, Heddesheim, all of Fed. Rep. of Germany; Jürgen Mertin, Walenstadt, Switzerland, and Otto-Henning Wilhelms, Weinheim-Rittenweier, Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

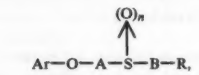
Division of Ser. No. 11,096, Feb. 5, 1987, Pat. No. 4,906,666. This application Jan. 17, 1990, Ser. No. 466,197

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1986, 3604050

Int. Cl.[5] A61K *31/41*; C07D *257/04, 257/06*

U.S. Cl. 514—381 **20 Claims**

1. A compound of the formula:



wherein

Ar is phenyl, phenyl substituted one or more times by a radical selected from the group consisting of C_1–C_6 alkyl, C_2–C_6 alkenyl, C_1–C_6 alkoxy, C_1–C_6 alkylthio, C_1–C_4 alkanoyl, hydroxyl, hydroxy-C_1–C_6-alkyl, carboxyl, C_1–C_6 alkoxycarbonyl, carbamoyl, nitro, amino or halogen,

A is a straight-chained or branched, saturated or unsaturated C_1–C_8 aliphatic hydrocarbon which is unsubstituted or substituted by a hydroxyl group,

n is 0, 1 or 2,

B is a straight-chained or branched, saturated or unsaturated C_1–C_8-aliphatic hydrocarbon and

R is 5-(1H)-tetrazolyl,

—CO—NH—tetrazolyl or

5—(1H)—tetrazolylthio; or

a pharmacologically acceptable salt thereof.

15. A pharmaceutical composition for combating allergic diseases containing an effective amount to combat allergic diseases of the compound of claim 1 in a pharmaceutically acceptable carrier.

16. The pharmaceutical composition of claim 15 wherein said compound is selected form one or more of the group consisting of 5-{S-[3-(4-acetyl-3-hydroxy-2-allylphenoxy)-propyl]-thiomethyl}1-(1H)-tetrazole; N-[(1H)-tetrazol-5-yl]-S-[3-(3,4-dichlorophenoxy)-propyl]-3-thiopropionic acid amide, 5-{S-[3-(4-acetyl-3-hydroxy-2-propylphenoxy)-propyl]-5-thiopentyl}-(1H)-tetrazole and 5-{S-[3-(4-acetyl-3-hydroxy-2-propylphenoxy)-propyl]-2-thioethyl}-1(1H)-tetrazole.

5,025,029

METHOD FOR AUGMENTING FETAL HEMOGLOBIN

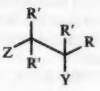
Susan Perrine, Richmond, Calif., assignor to Children's Hospital Medical Center of Northern California, Oakland, Calif.

Continuation-in-part of Ser. No. 277,151, Nov. 29, 1988, abandoned, which is a continuation-in-part of Ser. No. 917,805, Oct. 10, 1986, Pat. No. 4,811,821. This application May 4, 1990, Ser. No. 518,454

Int. Cl.[5] A61K *31/19, 31/41, 31/255*

U.S. Cl. 514—381 **14 Claims**

1. A method for ameliorating β-globin disorders in a mammal comprising the step of introducing into the bloodstream of said mammal periodically during its gestation period and/or infancy, a compound of the formula I:



wherein R is $—CO_2R_1$, $—SO_2R_1$, $—SO_3R_1$, or

and R_1 is NH_2, H, M, branched or linear alkyl 1–4 carbons or partially or perfluorinated branched or linear alkyl of 1–4 carbon atoms, and M is a cation; Z is $—CH_3$, —X, or $—CX_3$; and X is H, Cl, F, Br, I or combinations thereof; Y is H, $—NH_2$, $—NH_3^+$, $—CX_3$ or F; and R′ is H or F; or a mixture thereof, in an amount, frequency and duration of life sufficient to inhibit or reverse fetal γ to β-globin switching.

5,025,030

HYDROXYALKINYL-AZOLYL DERIVATIVES

Reinhard Lantzsch, Wuppertal; Ernst Kysela, Bergisch-Gladbach; Karl H. Büchel, Burscheid; Stefan Dutzmann, Duesseldorf; Wilhelm Brandes, Leichlingen, and Gerd Hänssler, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengeselischaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 7, 1989, Ser. No. 376,721

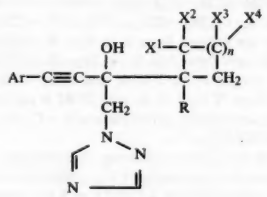
Claims priority, application Fed. Rep. of Germany, Jul. 19, 1988, 3824434

The portion of the term of this patent subsequent to May 15, 2007, has been disclaimed.

Int. Cl.[5] A01N *43/653;* **C07D** *249/08*

U.S. Cl. 514—383 **11 Claims**

1. A hydroxyalkynyl-azolyl derivative of the formula



(I)

in which

Ar represents phenyl which can be monosubstitued to trisubstituted by

X^1 represents halogen,

X^2 represents hydrogen or halogen,

X^3 represents hydrogen or halogen, .

X^4 represents hydrogen or halogen and

n represents 0 or 1,

or an acid addition salt or metal salt complex thereof.

5,025,031

ARYL AND ARYLOXYALKYL SULFAMATE ESTERS USEFUL AS ANTICONVULSANTS

Young S. Lo; David A. Walsh, both of Richmond, and Ibrahim M. Uwaydah, Chesterfield, all of Va., assignors to A. H. Robins Co., Inc., Richmond, Va.

Filed Nov. 30, 1989, Ser. No. 443,146

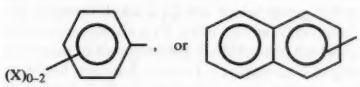
Int. Cl.[5] A61K *31/415, 31/255*

U.S. Cl. 514—399 **14 Claims**

1. A method of treating convulsions in a mammal, comprising administering to said mammal an effective anticonvulsant amount of a compound having the formula:

$$(HO)_p—A—[OS(O)_2NR^1R^2]_z$$

wherein A is substituted on one or more carbon atoms by an aminosulfonyloxy radical, said A being selected from aryl, arylalkyl, or aryloxyalkyl with a proviso that when A is arylalkyl, and the aryl moiety is phenyl, z is always two; Aryl or aryl moieties are selected from:



X is selected from hydrogen, halo, phenyl, phenoxy, benzoyl, loweralkyl, loweralkoxy, carboxy, amino, loweralkyl amino, diloweralkyl amino, acetamido, cyano, nitro, loweralkoxycarbonyl, 1H-imidazol-1-yl, aminosulfonyl, 4-phenyl-1H-imidazol-1-yl, 4-methyl-1H-imidazol-1-yl, 1-triazolyl, 2-methyl-1H-imidazol-1-yl, phenylloweralkoxy, or hydroxy; z is 1 or 2 and is the number of $—OS(O)_2NR^1R^2$ groups, p is 0 or 1 and is the number of untreated hydroxyl groups, R^1 and R^2, same or different, are hydrogen or loweralkyl; the optical isomers thereof, when they can be formed; and the pharmaceutically acceptable addition salts thereof, when they can be formed.

5,025,032

PHENYL BUTYL NITRONE COMPOSITIONS AND METHODS FOR TREATMENT OF OXIDATIVE TISSUE DAMAGE

John M. Carney, Lexington, Ky., and Robert A. Floyd, Oklahoma City, Okla., assignors to Oklahoma Medical Research Foundation, Oklahoma City, Okla. and University of Kentucky Research Foundation, Lexington, Ky.

Filed Oct. 17, 1989, Ser. No. 422,651

Int. Cl.[5] A61K *31/415*

U.S. Cl. 514—400 **18 Claims**

1. A method for in vivo treatment of oxidative CNS tissue damage resulting from ischemia or inflammation comprising:

providing α-phenyl t-butyl nitrone and derivatives thereof having spin trapping activity and preventing ATP depletion in vivo in tissue and

a pharmaceutically acceptable carrier for delivery of the α-phenyl t-butyl nitrone to the CNS of a patient.

5,025,033

ALKYLENE DIAMINES

Giichi Goto, Osaka, and Akinobu Nagaoka, Kawanishi, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

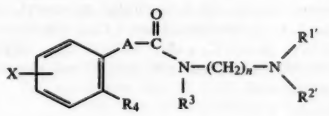
Filed Jan. 25, 1989, Ser. No. 301,065

Claims priority, application Japan, Jan. 29, 1988, 63-021009; May 10, 1988, 63-114360

Int. Cl.[5] A61K *31/40;* **C07D** *487/02, 209/48;* **C07C** *233/64*

U.S. Cl. 514—417 **13 Claims**

1. A compound of the formula



wherein

$R^{1'}$ is a hydrogen atom or C_{1-4} alkyl group which may be substituted by a hydroxy group:

$R^{2'}$ is benzyl, naphthylmethyl, 1-phenylethyl or benzhydryl, each of which may be substituted by one to three substituents selected from the group S^1 consisting of

(a) halogen, nitro, nitrile, hydroxy, C_{1-4} alkoxy, C_{1-4} alkylthio, amino, mono- or di-C_{4-4}-alkyl substituted amino, C_{1-4} alkoxycarbonyl, carboxy, C_{1-6} alkylcarbonyl, carbamoyl, mono- or di-C_{1-4} alkyl-substituted carbamoyl and adamantan-1-yl; and

(b) phenyl, naphthyl, benzoyl, phenoxycarbonyl, phenyl-C_{1-4} alkylcarbamoyl or phenylcarbamoyl, wherein the substituent (b) has 0–4 further substituents on the phenyl or naphthyl group which are C_{1-4} alkyl, halogen, hydroxy, benzyloxy, amino, nitro, C_{1-4} alkoxycarbonyl or a phenyl which phenyl has 0–4 substituents of the group consisting of C_{1-4} alkyl, C_{1-4} alkoxy, halogen, hydroxy, benzyloxy, amino, mono- or di-C_{1-4} alkyl substituted amino, nitro or C_{1-4} alkoxycarbonyl;

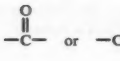
R^3 is

(1) a hydrogen atom,

(2) a straight or branched C_{1-11} alkyl, C_{2-4} alkenyl, or C_{4-4} alkynyl, a monocyclic C_{3-7} cycloalkyl, bicyclo[3,2,1]oct-2-yl, bicyclo[3,3,1[non-2-yl, adamantan-1-yl, a phenyl or a naphthyl, each of which may be substituted by one to three substituents selected from the above defined group S^1, or

(3) a C_{1-6} alkylcarbonyl, C_{3-8} cycloalkylcarbonyl, a C_{3-8} cycloalkyl-C_{1-6} alkylcarbonyl, a C_{2-6} alkenyl- or alkynyl-carbonyl, a benzoyl, a naphthoyl, carbamoyl, a mono- or di-C_{1-4} alkylcarbamoyl, a mono or di-C_{3-6} alkenyl- or alkynylcarbamoyl, phenylcarbamoyl, naphthylcarbamoyl, diphenylcarbonyl, sodiumsulfonyl, a C_{1-6} alkylsulfonyl, a C_{2-6} alkenyl or alkynylsulfonyl, phenylsulfonyl, naphthylsulfonyl, a C_{1-6} alkyloxycarbonyl, a C_{3-8} cycloalkyloxycarbonyl, a C_{2-7} alkenyl or alkynyl oxycarbonyl, a phenyloxycarbonyl or a benzyloxycarbonyl, each of which may be substituted by one to three substituents selected from the above-defined group S^1, and R^4 is a hydrogen atom, or

R^3 and R^4 combinedly form a group of the formula



A is a bond or —CH=CH—;

X represents one substituent or two substituents selected from the group S^3 consisting of C_{1-4} alkyl, halogen atoms, nitro, nitrile, C_{1-4} alkoxy, phenoxy, C_{1-4} alkylcarbonyl amino, C_{1-4} alkylsulfonylamino, phenyl-C_{1-4} alkylsulfonylamino, phenylsulfonylamino, C_{1-4} alkylcarbonyl, C_{1-4} alkoxycarbonyl, phenoxycarbonyl, benzoyl, carbamoyl, mono- or di-C_{1-4} alkyl-substituted carbamoyl, phenylcarbamoyl, C_{1-4} alkylthio, phenyl C_{1-4} alkylthio, C_{1-6} alkylsulfinyl, phenyl C_{1-4} alkyl sulfinyl, C_{1-6} alkylsulfonyl, phenyl-C_{1-4} alkylsulfonyl, phenyl, and phenyl-C_{1-4} alkyl groups; and

n is an integer of 4 to 7;

or a pharmaceutically acceptable salt thereof.

13. A pharmaceutical agent for treatment of hypoxic cerebral dysfunction which contains an effective cholinesterase inhibiting amount of a compound of claim **1** and a pharmaceutically acceptable carrier.

5,025,034

PROSTAGLANDINS

Robert L. Jones, and Norman H. Wilson, both of Edinburgh, Scotland, assignors to National Research Development Corporation, London, England

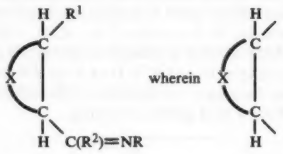
Division of Ser. No. 377,760, Jul. 5, 1989, Pat. No. 4,945,106, which is a continuation of Ser. No. 807,442, Dec. 10, 1985, abandoned, which is a division of Ser. No. 349,084, Feb. 12, 1982, Pat. No. 4,596,823. This application Feb. 7, 1990, Ser. No. 476,562

Claims priority, application United Kingdom, Jul. 1, 1980, 8021537

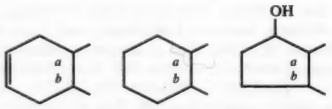
Int. Cl.[5] **C07C** *177/00;* **A01K** *31/557*

U.S. Cl. 514—529 **36 Claims**

1. A compound of the formula (I)



represents one of the divalent groups



the letters a and b indicating in each case the points of attachment of the substituents R^1 and $C(R^2)$=NR, respectively: wherein

R^1 is a group of the formula R'—COQ where R' is selected from the group consisting of —$(CH_2)_j$— where j is an integer from 4 to 8; —CH=CH—$(CH_2)_k$—, where k is 2 or 3; —CH_2—CH=CH—$(CH_2)_m$—, where m is an integer from 1 to 5; —CH_2—CH_2—CH=CH—$(CH_2)_n$—, where n is 0 or an integer from 1 to 4; —X—$(CH_2)_p$—, where p is an integer from 3 to 7; —CH_2—X—$(CH_2)_q$—, where q is an integer from 2 to 6; and CH_2—CH_2—X—$(CH_2)_m$—, where X is O or S; and COQ is carboxy, a physiologically acceptable carboxylate salt, a C_1–C_5 alkyl ester or $CONHSO_2CH_3$;

R_2 is selected from the group consisting of hydrogen, C_{1-10} aliphatic hydrocarbon groups, and C_{1-10} aliphatic hydrocarbon groups substituted by Ar, OAr or SAr, where Ar represents a phenyl, naphthyl, fluorenyl, dibenzocyclohexyl, dibenzocycloheptyl, pyridyl, benzthiazolyl, dihydrobenzthiazolyl, N-methyldihydrobenzthiazolyl, benzoxazolyl, dihydrobenzoxazolyl or N-methydihydrobenzoxazolyl group or such a group substituted by one or more substituents selected from C_{1-10} alkoxy, halogen, C_{1-10} halogen-substituted alkyl, sulphamoyl, amino, hydroxyl, nitro and C_{1-10} alkyl groups; and

R is a group —OR^3, —OR^4, —A—R^3 or —N=R^5 in which A is —NH—, —NH.CO—, —NH.CO.$CH_2N(R^6)$—, —$NH.SO_2$—, —NH.CO.NH— or —NH.CS.NH— and wherein R^3 is a C_{1-10} aliphatic hydrocarbon group, a group Ar or a C_{1-10} aliphatic hydrocarbon group substituted by one or more groups selected from Ar, OAr, and SAr; R^4 is a C_{1-10} aliphatic hydrocarbon group which is substituted through an oxygen atom by a C_{1-10} aliphatic hydrocarbon group which is itself substituted by one or more groups Ar; R^5 is a C_{1-10} aliphatic hydrocarbon group, a group Ar', where Ar' represents a fluorenylidene, dibenzocyclohexylidene, dibenzocycloheptylidene, dihydrobenzthiazolylidene, N-methyldihydrobenzthiazolylidene, dihydrobenzoxazolylidene or N-methyldihydroben-

zoxazolylidene group or such a group substituted on a benzene ring or rings thereof by one or more substituents selected from C_{1-10} alkoxy, halogen, C_{1-10} halogen-substituted alkyl, sulphamoyl, amino, hydroxyl, nitro and C_{1-10} alkyl groups, or a C_{1-10} aliphatic hydrocarbon group substituted by one or more groups selected from Ar, OAr and SAr; an R^6 is hydrogen, a C_{1-10} aliphatic hydrocarbon group, a group Ar or a C_{1-10} aliphatic hydrocarbon group substituted by one or more groups selected from Ar, POAr and SAr.

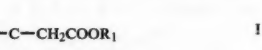
5,025,035

METHOD OF TREATING DEPRESSION

Jan D. Wallace, Ann Arbor, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Oct. 12, 1990, Ser. No. 596,270
Int. Cl.[5] A61K *31/20, 31/205, 31/215*
U.S. Cl. 514—530 **3 Claims**

1. A method for treating depression which comprises administering a therapeutically effective amount of a compound of formula



I

or a pharmaceutically acceptable salt thereof, wherein R_1 is hydrogen or a lower alkyl and n is 4, 5, or 6, in unit dosage form, to a mammal in need of said treatment.

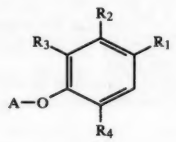
5,025,036

CATECHOL CARBOXYLIC ACIDS

Matthew Carson, Nutley; Ru-Jen L. Han, Princeton Junction, and Ronald A. LeMahieu, North Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 234,239, Aug. 19, 1988, abandoned, which is a continuation-in-part of Ser. No. 223,470, Jul. 22, 1988, abandoned, which is a continuation-in-part of Ser. No. 103,789, Oct. 1, 1987, abandoned. This application May 3, 1989, Ser. No. 347,109
Int. Cl.[5] A61K *31/19*
U.S. Cl. 514—568 **59 Claims**

1. A compound of the formula

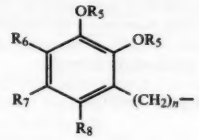


I

wherein,
R_1 is

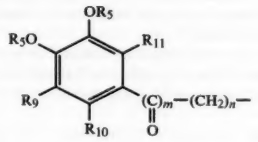
hydrogen, acetyl, hydroxy or alkanoyloxy,
R_2 is

hydroxy, hydrogen or alkanoyloxy,
wherein R is hydrogen, lower alkyl or $-(CH_2)_n-N-$(lower alkyl)$_2$,
R_3 is hydrogen, lower alkyl or amino,
R_4 is hydrogen, lower alkyl, halogen or amino, and
A is



(A')

or



(A'')

wherein, R_5 is hydrogen, benzoyl or alkanoyl of 1 to 7 carbon atoms, R_6 is hydrogen, halogen lower alkyl, cycloalkyl, phenyl or phenyl bearing one or two substituents independently selected from the group consisting of halogen, trifluoromethyl, lower alkyl, lower alkoxy, nitro, amino, lower alkylamino and di-lower alkylamino, and R_7 and R_8, independently, are hydrogen, lower alkyl or halogen, R_9 is hydrogen or lower alkyl, R_{10} is lower alkyl, hydrogen or halogen R_{11} is hydrogen, lower alkyl, cycloalkyl or halogen, m is 0 or 1, n is an integer of 2 to 10, provided, that no more than one of R_1 or R_2 can be hydroxy, alkanoyloxy or

or, when R is hydrogen, a salt thereof with a pharmaceutically acceptable base, or, when R is $-(CH_2)_n-N-$(lower alkyl)$_2$, an addition salt thereof with a pharmaceutically acceptable acid.

5,025,037

USES FOR THE ORAL USE OF OAK POISON PREVENTATIVE IN THE TREATMENT OF: FELINE LEUKEMIA, INCREASED WOOL PRODUCTION IN SHEEP, AND REDUCTION OF SHIPPING FEVER IN STRESSED ANIMALS

William H. Livingston, 3003 N. 13th St., Artesia, N. Mex. 88210

Filed Nov. 3, 1989, Ser. No. 434,781
Int. Cl.[5] A61K *31/19, 33/26*
U.S. Cl. 514—574 **3 Claims**

1. A method of using the Oak Poison Preventative to aid in the treatment of feline leukemia in cats comprising administering to said cats a therapeutically effective amount of the Oak Poison Preventative.

5,025,038

PROCESS FOR THE PREPARATION OF ANTIMICROBIAL FORMULATIONS OF 2-(ALKYLTHIO)ETHANAMINE HYDROHALIDES

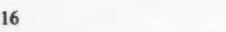
Attila G. Relenyi, and Charles D. Gartner, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 318,787, Mar. 3, 1989, Pat. No. 4,982,004. This application Oct. 12, 1990, Ser. No. 596,431
Int. Cl.[5] A01N *33/08, 37/18*
U.S. Cl. 514—665 **2 Claims**

1. An antimicrobial composition which comprises 1 to 40 weight percent of a 2-(alkylthio)ethanamine hydrohalide of the formula $R\text{-}SCH_2CH_2NH_3\oplus X\ominus$, wherein R represents a straight or branches chain alkyl group of 8 to 12 carbon atoms

and X⊖ represents a chloride or bromide anion, 1 to 50 weight percent propylene glycol, 30 to 95 weight percent water, 0.25 to 10 weight percent propionic acid, and 0 to 10 weight percent potassium propionate, wherein the antimicrobial composition is prepared by a process which comprises the steps of:

(a) hydrolyzing an amide of the formula



wherein

R is as previously defined,

to the 2-(alkylthio)ethanamine hydrohalide and propionic acid by contacting the amide with aqueous hydrochloric or hydrobromic acid;

(b) neutralizing any remaining hydrochloric or hydrobromic acid and a part of the propionic acid formed by contacting the amide hydrolysate with aqueous potassium hydroxide; and

(c) diluting the neutralized hydrolysate with propylene glycol and, optionally, additional water.

5,025,039

PROCESS FOR THE PRODUCTION OF MOLDED POLYURETHANE FOAMS AND THE MOLDED FOAMS OBTAINED BY THIS PROCESS

Alfred Neuhaus, Leverkusen; Otto Ganster, Odenthal, and Richard Kopp, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 22, 1989, Ser. No. 440,627

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1988, 3840817

Int. Cl.[5] C08G *18/14*

U.S. Cl. 521—51 **24 Claims**

1. A process for the production of a molded polyurethane foam having a density of at least 250 kg/m^3 and a compact surface which comprises foaming inside a closed mold at an isocyanate index of about 75 to 1500 a reaction mixture comprising

a) a polyisocyanate component comprising at least one aromatic polyisocyanate,

b) an isocyanate-reactive component comprising at least one organic compound containing at least two isocyanate-reactive groups,

c) a blowing agent comprising an organic carboxylic acid.

5,025,040

FLUID LOSS CONTROL ADDITIVES FOR OIL WELL CEMENTING COMPOSITIONS

Stefano C. Crema, Ypsilanti, Mich.; Clare H. Kucera, Tulsa, Okla.; Gerd Konrad, and Heinrich Hartmann, both of Limburgerhof, Fed. Rep. of Germany, assignors to BASF, Parsippany, N.J.

Filed Jun. 11, 1990, Ser. No. 535,625

Int. Cl.[5] C09K *7/00;* **C08B** *11/193, 11/00, 11/12*

U.S. Cl. 523—130 **6 Claims**

1. A cementing composition useful in cementing oil, gas and water wells comprising:

a) water;

b) hydraulic cement; and

c) a fluid loss additive in an amount effective to reduce fluid loss, said fluid loss additive comprised of a blend of a copolymer of acrylamide and vinyl imidazole, in a weight percent ratio of from about 95:5 to 5:95, acrylamide to vinyl imidazole said copolymer having a molecular weight range of from about 10,000 to 3,000,000, and a terpolymer of acrylamide, acrylamidomethylpropane sulfonic acid sodium salt and vinyl imidazole in a weight percent ratio of 60:20:20; the ratio of copolymer to terpolymer being in the range of 20:80 to 80:20.

5,025,041

PEARLESCENT COATING COMPOSITIONS

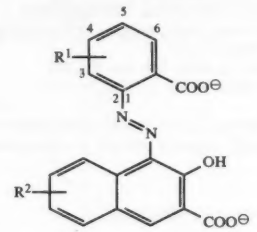
Johannes Pfenninger; Edward E. Jaffe, both of Willmington, Del., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 15, 1989, Ser. No. 366,900

Int. Cl.[5] C09D *5/36, 133/08;* **C08K** *5/23*

U.S. Cl. 523—171 **11 Claims**

1. A pearlescent coating composition comprising a resin binder system selected from the group consisting of acrylic, alkyd, polyurethane, polyester and aminoplast resins, metallic oxide coated mica particles and a manganese salt of an azo pigment corresponding to the formula



(I)

wherein R^1 and R^2, independent of each other, are hydrogen, C_1–C_4-alkoxy, halogen, nitro, cyano, C_1–C_4-alkoxycarbonyl, carbamoyl or sulfamoyl.

5,025,042

FLAME RETARDANT COMPOSITION

Mamoru Yoshida, Yokohama; Hachiro Suya, Ayase; Shoji Hayashi, Yokohama; Takao Koshiyama, Sagamihara; Satoshi Hashimoto, and Katsuhiro Horita, both of Yokosuka, all of Japan, assignors to Nippon Unicar Company Limited, Danbury, Conn.

Filed Jul. 21, 1989, Ser. No. 382,919

Claims priority, application Japan, Jul. 29, 1988, 63-188179

Int. Cl.[5] C08K *9/00, 3/10;* **C08L** *83/00*

U.S. Cl. 523—216 **19 Claims**

1. A composition comprising:

(i) a thermoplastic resin; and

(ii) magnesium hydroxide, the surface of which has been treated with an organic aminosilane, said magnesium hydroxide having (a) a strain in the <101> direction of no more than 3.0 a 10^{-3}; (b) a crystallite size in the <101> direction of more than 800 angstroms; and (c) a surface area, determined by the BET method, of less than 20 square meters per gram

wherein the aminosilane is present in an amount of about 0.1 to about 3 parts by weight of aminosilane per 100 parts by weight of resin.

5,025,043

POLYMERIZED FATTY ACID POLYAMIDE RESIN DISPERSIONS AND METHOD FOR THE MANUFACTURE THEREOF

George A. Smith, Langhorne, Pa., assignor to Union Camp Corporation, Wayne, N.J.

Continuation of Ser. No. 151,773, Feb. 3, 1988, abandoned. This application Jan. 16, 1990, Ser. No. 464,572

Int. Cl.[5] C08J *3/03;* **C08K** *5/09;* **C08L** *77/08*

U.S. Cl. 523—326 **14 Claims**

1. In a method for the preparation of an aqueous dispersion of a polyamide resin which comprises heating said resin to at least its melting point to liquify said resin, adding said liquified resin to water and an effective amount of a surfactant effective in forming emulsions of said liquified resin in water to form a mixture, subjecting the mixture to comminuting forces, and cooling said mixture below the melting temperature of said resin; the improvement of providing aqueous polyamide resin dispersions stable against separation into separate phases at

ambient temperatures in excess of 24 hours wherein: (1) said polyamide resin is an amorphous, non-solvated, un-neutralized, polymerized fatty acid polyamide resin, the polymerized fatty acid portion thereof obtained by polymerization of a saturated, ethylenically unsaturated or acetylenically unsaturated monobasic carboxylic acid containing 8 to 24 carbon atoms and the resin having an acid number of up to about 12 and an amine number of up to about 10, (2) the water is heated to a temperature such that the mixture will have a temperature above the melting point of said polyamide resin, the percentage of said resin in said mixture with water being between about 20 and about 60 percent, (3) said surfactant is other than the salt of an organic primary amine, and (4) the step of subjecting the mixture to comminuting forces forms an emulsion of droplets of said liquified resin in water having an average volume size distribution of less than 20 microns.

5,025,044

EXTRUSION ISOLATION OF BLENDS OF RUBBER AND ASPHALT

Lance A. Christell, Prospect, Ky., and Fred Y. Kafka, Parkersburg, W. Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 429,581, Oct. 31, 1989, abandoned. This application Sep. 25, 1990, Ser. No. 586,855

Int. Cl.[5] C08J *3/20*; C08L *95/00*

U.S. Cl. 523—334 **13 Claims**

1. A process for blending elastomeric latices and asphalt comprising feeding an aqueous emulsion of elastomeric latex selected from the group consisting of chloroprene polymer latexes, polyisoprene latexes, polystyrene/butadiene latexes, and polybutadiene latexes containing 15 to 70 weight percent elastomer, and asphalt in the form of a melt or in the form of an emulsion containing 20–70 weight percent asphalt to a screw extruder having a flow restriction to apply a back pressure sufficient that water present in the aqueous emulsion is forced out of a vent provided in the extruder upstream from said flow restriction to apply back pressure, feeding asphalt and elastomer through said restriction and recovering the thus formed blend of 5 to 98 weight percent asphalt and 2 to 95 weight percent elastomer from said extruder.

5,025,045

DAMAGE TOLERANT COMPOSITES CONTAINING INFUSIBLE PARTICLES

Irena Gawin, Sandy, Utah, and Brian J. Swetlin, Wilmington, Del., assignors to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 137,846, Dec. 24, 1987, abandoned. This application Dec. 20, 1988, Ser. No. 286,840

Int. Cl.[5] C08L *63/00*

U.S. Cl. 523—440 **5 Claims**

1. An epoxy resin composition comprising a polyepoxide component, a reactive oligomer, a curing agent and infusible particulate, said resin composition exhibiting phase separation upon cure into crosslinked glassy phases and made by a process comprising combining:

100 parts by weight of a polyepoxide component comprising a polyepoxide compound having a glass transition below 50° C. and having at least about two epoxide groups per molecule;

between about 10 and 200 parts by weight of a reactive oligomer component comprising a crosslinkable oligomer having at least about two crosslinkable groups per molecule and a molecular weight (number average) between about 2000 and 10,000;

between about 5 and 100 parts by weight of a curing agent for crosslinking said epoxy composition and having a molecular weight below about 1000; and

between about 1 and 16% by weight of said epoxy resin composition of infusible particles comprising a rubber polymer wherein said rubber polymer is not crosslinkable in said epoxy resin composition, an amount of said polymer being contained within said infusible particles that are dispersed throughout said resin composition and have a lower modulus than the matrix of said epoxy resin composition that is cured in absence of said infusible particles.

5,025,046

CREPING ADHESIVE COMPOSITION

Dave A. Soerens, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Dec. 15, 1989, Ser. No. 451,491

Int. Cl.[5] C08L *97/00*

U.S. Cl. 524—72 **6 Claims**

1. A creping adhesive comprising from about 85 to about 99.5 weight percent water and from about 0.5 to about 15 weight percent dissolved or suspended solids, said solids comprising from about 65 to about 90 weight percent polyvinyl alcohol, from about 1 to about 15 weight percent polyethylene oxide, and from about 5 to about 35 weight percent lignin sulfonate.

5,025,047

USE OF N,N'- AND N,N',N'-SUBSTITUTED SILYL UREAS AS ANTIDEGRADATION AGENTS AND POLYMER BLENDS WHICH CONTAIN THEM

Siegfried Wolff, Bornheim-Merten, and Udo Goerl, Meckenheim, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 19, 1990, Ser. No. 615,267

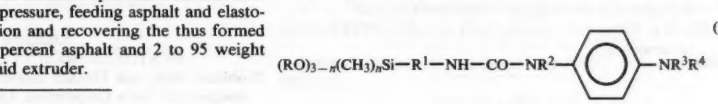
Claims priority, application Fed. Rep. of Germany, Nov. 20, 1989, 3938488

Int. Cl.[5] C08K *5/54*

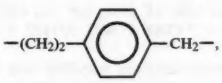
U.S. Cl. 524—99 **16 Claims**

1. A polymer blend comprising polymers and N,N'-and N,N',N'-substituted silyl ureas, as antidegradation agents in polymers, of the general formula I:

(I)



wherein n=0,1 or 2, R=C_1–C_6 alkyl, linear or branched, phenyl, C_5–C_8 cycloalkyl, R^1=—$(CH_2)_3$—,



R^2, R^3, R^4 which may be the same or different=hydrogen, C_1–C_{18} alkyl, linear or branched, C_5–C_8 cycloalkyl, C_1–C_3 alkyl, terminally substituted by an amino, thio or cyano group, —$(C_2H_4NH)_mH$ where m=2 or 3, C_3–C_{18} alkenyl, linear or branched, benzyl, phenyl, naphthyl, pyridyl, triazyl, optionaliy singly or multiply substituted by an amino, hydroxyl, thio, C_1–C_4-alkyl, C_1–C_4-alkoxy, -nitro or carboxyl group.

5,025,048

ORGANOSILICON COMPOSITION COMPRISING STABILIZER

Julia S. Burnier, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Apr. 12, 1990, Ser. No. 508,323

Int. Cl.[5] G08K *5/3435*

U.S. Cl. 524—99 **20 Claims**

1. A composition comprising:

(A) (i) a crosslinked organosilicon polymer or crosslinkable organosilicon prepolymer comprising alternating (a) cyclic polysiloxane or tetrahedral siloxysilane residues and (b)

polycyclic hydrocarbon residues derived from polycyclic polyenes having at least two carbon-carbon double bonds in their rings linked through carbon to silicon bonds, wherein at least one of the cyclic polysiloxanes or tetrahedral siloxysilanes (a) or the polycyclic polyenes (b) used to form the polymer or prepolymer has more than two reactive sites; or (ii) a crosslinked or crosslinkable linear poly(organohydrosiloxane) polymer having at least 30% of its ≡SiH groups reacted with hydrocarbon residues derived from polycyclic polyenes having at least two carbon-carbon double bonds in their rings; and

(B) as an antioxidant, a compound comprised of at least one hindered phenol and at least one hindered amine.

5,025,049

ALKOXYSILYLATED ACRYLIC OR VINYLIC RESIN CONTAINING PRIMER COMPOSITIONS

Mitsuhiro Takarada, Annaka, and Kazuharu Sato, Miyogimachi, both of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed May 30, 1990, Ser. No. 530,596

Claims priority, application Japan, Jun. 2, 1989, 1-140725

Int. Cl.[5] C08K *5/47, 5/13, 5/29*

U.S. Cl. 524—91 **19 Claims**

1. A primer composition dilluted with an organic solvent comprising:

(A) 100 parts by weight of an organic copolymer comprising an alkoxysilylated acrylic and/or vinylic monomer, vinyl acetate and other monomers copolymerizable therewith;

(B) 10 to 100 parts by weight (both exclusive) of a polymer or copolymer comprising one or more monomers selected from the group consisting of alkyl acrylates and alkyl methacrylates, each alkyl group having 1 to 8 carbon atoms;

(C) 20 to 100 parts by weight (both exclusive) of a crosslinking agent for said organic copolymer (A); and

(D) 10 to 100 parts by weight (both exclusive) of an ultraviolet absorber.

5,025,050

ULTRAVIOLET-RADIATION STABILIZER AND FLAME RETARDANT SYSTEMS

James E. Torres, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Mar. 16, 1990, Ser. No. 494,398

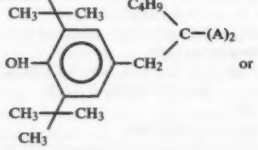
Int. Cl.[5] C08K *5/3435, 5/3492, 5/521*

U.S. Cl. 524—91 **8 Claims**

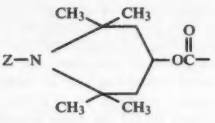
1. An ultraviolet-radiation stabilizer and flame retardant system containing,

(a) a flame retardant amount of an N,N′-ethylene-bis (tetrabromophthalimide) or N,N′-bis (tetrabromophthalmide) predominate product, which product is characterized by having a Y.I. (ASTM 1925) no greater than about 16 after being exposed to oven aging at a temperature of from about 210° C. to about 230° C. for about 6 hours;

(b) a hindered-amine light stabilizer selected from a compound of the formula ABA or



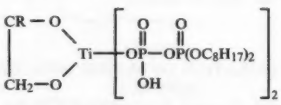
or



in which Z is, for each A, independently selected from H and —CH_3 and wherein B is —$(CH_2)_n$, with n being whole integer and with $2 \leqq n \leqq 10$;

(c) a 2-(2′-hydroxyphenyl)benzotriazole;

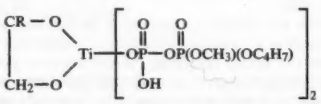
(d) a titanate selected from the group consisting of,



(I)

wherein R=(−H)$_2$ or =O;

a methacrylate functional amine adduct of (I) when R=(−H)$_2$, an acrylate functional amine adduct of,



(II)

and mixture of two or more of the foregoing; and,

(e) optionally, $Mg(OH)_2$ and or ZnO.

5,025,051

SYNTHETIC RESIN COMPOSITION

Yoshinori Sato, and Hiroshi Akamine, both of Kazo, Japan, assignors to Ferro Corporation, Cleveland, Ohio

Filed Jun. 15, 1989, Ser. No. 446,891

Claims priority, application Japan, Oct. 20, 1987, 62-265088; Sep. 13, 1988, 63-227604

Int. Cl.[5] C08K *5/34*

U.S. Cl. 524—99 **9 Claims**

1. A synthetic resin composition comprising:

(A) 100 parts by weight of a synthetic resin; and

(B) 0.01 –10 parts by weight of a mixed product of

(a) a compound having at least one piperidyl group and

(b) perchloric acid

(c) optionally, an inorganic substance other than perchloric acid.

5,025,052

FLUOROCHEMICAL OXAZOLIDINONES

Davis H. Crater, White Bear Lake; Richard D. Howells, St. Paul; Richard M. Stern, Woodbury, and John A. Temperante, St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

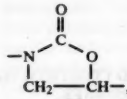
Division of Ser. No. 235,757, Aug. 8, 1988, abandoned, which is a continuation of Ser. No. 906,817, Sep. 12, 1986, abandoned.

This application Feb. 27, 1990, Ser. No. 486,598

Int. Cl.[5] C08K *5/3417*

U.S. Cl. 524—104 **13 Claims**

1. Fibers comprising a fiber-forming synthetic organic polymer and a fluorochemical oxazolidone composition comprising normally solid, water-insoluble, fluoroaliphatic compounds comprising one or more 2-oxazolidinone moities,



at least one of which has a monovalen fluoroaliphatic radical, R_f, which is a fluorinated, stable, inert, non-polar, oleophobic, hydrophobic radical having 3 to 20 carbon atoms and 40 to 78 weight percent fluorine and the terminal portion of which has at least three fully fluorinated carbon atoms, bonded to the 5-position carbon atom thereof by an organic linking group, Q, said fibers being oil and water repellent.

5,025,053

DIORGANOPOLYSILOXANES CONTAINING DIBENZOYLMETHANE FUNCTIONAL GROUPS

Edith Canivenc, Lyon; Serge Forestier, Claye-Souilly; Michel Gay, Lyon; Gerard Lang, Saint-Gratien, and Herve Richard, Paris, all of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

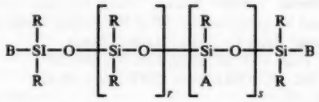
Filed Aug. 4, 1989, Ser. No. 389,780

Claims priority, application France, Aug. 4, 1988, 88 10778

Int. Cl.[5] C08K *5/24*

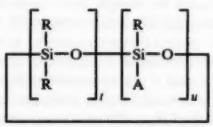
U.S. Cl. 524—265 **8 Claims**

1. A diorganopolysiloxane comprising dibenzoylmethane functional groups and having one of the following formulae (1) or (2):



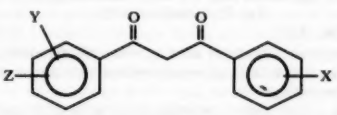
(1)

or



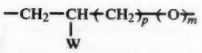
(2)

in which the symbols R, which may be identical or different, are each a C_1–C_{10} alkyl, vinyl, phenyl or 3,3,3-trifluoropropyl radical, at least 80% of the number of the radicals R being methyl radicals; the radicals B, which may be identical or different, are each a radical R or a radical A defined below; r is an integer ranging from 0 to 200; s is an integer ranging from 0 to 50, with the proviso that, if s is 0, at least one of the two symbols B is A; u is an integer ranging from 1 to 20; t is an integer ranging from 0 to 20; t+u is equal to or greater than 3; and the symbol A is a radical of the formula:



(3)

wherein X is a hydrogen atom, a linear or branched chain C_1–C_8 alkyl radical or a linear or branched chain C_1–C_8 alkoxy radical; Y is a hydrogen atom, a hydroxyl group or a C_1–C_4 alkoxy radical; and Z is a divalent radical of the formula:



in which m is 0 or 1, p is an integer ranging from 1 to 10 and W is a hydrogen atom or a C_1–C_4 alkyl radical, with the proviso that, when m is equal to 0, Y is an alkoxy radical or OH and is situated in a position ortho to Z.

5,025,054

POLISH CONTAINING A SILICONE RUBBER POWDER

Keiji Yoshida, Ichihara, and Mitsuo Hamada, Kisaratsu, both of Japan, assignors to Toray Silicone Company, Limited, Tokyo, Japan

Filed Nov. 9, 1989, Ser. No. 433,802

Claims priority, application Japan, Dec. 1, 1988, 63-304349

Int. Cl.[5] C08K *5/54*

U.S. Cl. 524—267 **7 Claims**

1. A polish comprising a film forming wax material and a silicone rubber, the rubber being in the form of particles of an average diameter of 0.1–1000 μm mixed with the film forming wax, the silicone rubber particles containing about 0.5 to about 80.0 percent of a silicone oil based on the weight of the silicone rubber particles.

5,025,055

POLYMER MIXTURE COMPRISING AROMATIC POLYCARBONATE AND TWO AGENTS TO IMPROVE THE IMPACT STRENGTH; ARTICLES FORMED THEREFROM

Wilhelmus J. L. A. Hamersma; Torben P. Kempers, both of Bergen op Zoom, and Wilhemus M. M. Roovers, Steenbergen, all of Netherlands, assignors to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 6, 1989, Ser. No. 446,733

Claims priority, application Netherlands, Dec. 19, 1988, 8803113

Int. Cl.[5] C08K *5/24*

U.S. Cl. 524—269 **8 Claims**

1. A polymer mixture which consists essentially of "A" an aromatic polycarbonate, "B" a first agent to improve the impact strength built up from a core which consists substantially of a diene rubber and on which at least one shell has been grafted consisting substantially of $C_{1\text{-}6}$ alkyl acrylates and/or $C_{1\text{-}6}$ alkyl-methacrylates, "C" a second agent to improve the impact strength consisting of a block copolymer with polycarbonate blocks and polysiloxane blocks, characterised in that the polymer mixture comprises moreover "D" a dialkyl silicone fluid polymer.

5,025,056

THERMOPLASTIC COMPOSITIONS HAVING IMPROVED MELT FLOW

Steven A. Jorissen, Mars, Pa.; Charles E. Lundy, Leverkusen Bayerwerk, Fed. Rep. of Germany; Sivaram Krishnan, Pittsburgh, Pa.; Robson Mafoti, Pittsburgh, Pa., and Robert A. Pyles, Bethel Park, Pa., assignors to Mobay Corporation, Pittsburgh, Pa.

Filed Aug. 16, 1990, Ser. No. 568,568

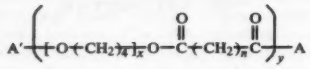
Int. Cl.[5] C08L *69/00, 67/02*

U.S. Cl. 524—310 **9 Claims**

1. A thermoplastic molding composition comprising

(i) at least one member selected from the group consisting of polycarbonate resin and aromatic polyestercarbonate, and

(ii) a thermoplastic copolyetherester having a weight average molecular weight of about 2000 conforming to



wherein x is about 2 to 15, n is about 3 to 10 and y is about 1 to 10. A and A' are end groups which may independently be a hydroxy group, a carboxy radical, a C_1—C_8 alkoxy or a C_6—C_{10} aryloxy group, said (ii) being present in an amount sufficient to increase the melt flow index of said member.

5,025,057

4-METHYL-1-PENTENE POLYMER COMPOSITIONS

Hiromi Shigemoto, Iwakuni, Japan, assignor to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Dec. 13, 1988, Ser. No. 283,974

Claims priority, application Japan, Dec. 22, 1987, 62-324386; Dec. 22, 1987, 62-324387

Int. Cl.[5] C08L *23/20, 23/10, 23/24*

U.S. Cl. 524—423 **3 Claims**

1. A 4-methyl-1-pentene polymer composition consisting essentially of:

(A) 90–10 parts by weight of 4-methyl-1-pentene polymer, which is crystalline homopolymer of 4-methyl-1-pentene or a α-olefin of 2–20 carbon atoms and which has at least 85 mol % 4-methyl-1-pentene and which has at least 85 mol % 4-methyl-1-pentene units;

(B) 90–10 parts by weight of propylene polymer which is crystalline homopolymer of propylene or a crystalline copolymer of propylene or a crystalline copolymer of propylene and less than 30% by weight of at least one other α-olefin having 2–20 carbon atoms, said propylene polymer having a melting point of at least 130° C. and a MFR of 0.1–80 g/10 min.;

(C) 70–10 parts by weight of an inorganic filler; and

(D) 20–3 parts by weight of α-olefin copolymer which is random copolymer of at least two different α-olefins, said random copolymer having a MFR of 0.1–50 g/10 min., a density of 0.850–0.900 g/cm^3, a melting point of 40°–80° C. and a crystallinity index as measured by X-ray of less than 40%, said copolymer selected from the group consisting of ethylene/propylene copolymers, ethylene/1-butene copolymers, ethylene/1-hexene copolymers, ethylene/1-octane copolymers, ethylene/1-decene copolymers, ethylene/1-hexadecene copolymers, propylene/1-butene copolymers, propylene/1-hexene copolymers, propylene/1-octene copolymers, propylene/1-decene copolymers, 1-butene/1-octene copolymers, 1-hexene/1-octene copolymers, ethylene/propylene/1-hexene copolymers and ethylene/1-butene/1-hexene copolymers.

2. The composition as claimed in claim 1, wherein the inorganic filler is calcium carbonate, magnesium carbonate, hydrous basic magnesium carbonate, kaolin, pyrophyllite, talc, calcined clay, diatomaceous earth or barium sulfate.

5,025,058

FLAME-RESISTANT NON-DRYING PUTTY COMPOSITION

Atsuyoshi Senoo, Tokyo, Japan, assignor to The Furukawa Electric Co., Ltd., Tokyo, Japan

Filed May 23, 1990, Ser. No. 527,563

Int. Cl.[5] C08K *3/10;* **C09K** *21/00*

U.S. Cl. 524—436 **12 Claims**

1. A flame-resistant, non-drying putty composition prepared by adding 2 to 20 parts by weight of an unvulcanized solid rubber, 10 to 50 parts by weight of a plasticizer, 300 to 800 parts by weight of a metal hydrate, 20 to 200 parts by weight of a filiated talc and 0.5 to 5 parts by weight of an organic fiber to 100 parts by weight of one liquid resin having a viscosity of 5,000 to 200,000 centipoise at room temperature or a mixture of two or more resins thereof and kneading the resultant composition.

5,025,059

PNEUMATIC TIRES WITH TREAD COMPRISING A BLEND OF ISOPRENE RUBBER, HIGH-TRANSPOLYBUTADIENE RUBBER AND CARBON BLACK

Hiroshi Mouri, and Shunji Araki, both of Tokyo, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Feb. 21, 1990, Ser. No. 482,606

Claims priority, application Japan, May 23, 1989, 1-127748

Int. Cl.[5] C08K *3/04;* **C08L** *7/00, 9/00*

U.S. Cl. 524—495 **2 Claims**

1. A pneumatic tire comprising a tire casing, a thread portion covering a crown portion between both shoulders thereof and a sidewall portion covering each side part of the casing, characterized in that a rubber component of a rubber composition constituting a ground contact part of said thread portion consists of 0–25 parts by weight of an isoprene series rubber containing not less than 70% by weight of isoprene units and 100–75 parts by weight of a high-trans polybutadiene rubber containing 75–90% by weight of 1,4-trans bond units and having a weight average molecular weight Mw of not less than 250,000 and a molecular weight distribution of $1.2 \leqq Mw/Mn \leqq 1.9$, and said rubber composition contains 40–80 parts by weight of carbon black having a specific surface area of nitrogen adsorption of 110–160 m^2/g and a compressed DBP oil absorption of 80–130 ml/100 per parts by weight of said rubber component.

5,025,060

DISPERSION OF FINE PARTICLES OF A POLYMER

Motoshi Yabuta; Yasushi Nakao; Shinji Sugiura; Mitsuhiro Fukuda, and Yuzo Miyamoto, all of Hiratsuka, Japan, assignors to Kansai Paint Co., Ltd., Hyogo, Japan

Filed Oct. 15, 1990, Ser. No. 596,327

Int. Cl.[5] C08J *3/02;* **C08F** *2/16, 20/62*

U.S. Cl. 524—533 **17 Claims**

1. A dispersion of fine particles of a gelled polymer obtained by copolymerizing and crosslinking a vinyl monomer mixture containing at least 0.5% by weight each of at least two vinyl monomers in the presence of a macromonomer A, which has a molecular chain of poly(12-hydroxystearic acid) and has at least about one polymerizable unsaturated double bond per molecule in average, and a macromonomer B, which is a copolymer of an ethylenic unsaturated monomer and has a solubility parameter value of from 7.5 to 9.2 and about 1.0 to about 1.5 in average of polymerizable unsaturated double bonds, in an organic solvent which is capable of dissolving said macromonomers A and B but is substantially incapable of dissolving a polymer formed from said vinyl monomer mixture.

5,025,061

AQUEOUS DISPERSION COATING MATERIAL

Masahiro Ishidoya; Toru Soma, both of Yokohama, and Hisao Ogawa, Zushi, all of Japan, assignors to Nippon Oil and Fats Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 206,478, Jun. 13, 1988, abandoned. This application Sep. 17, 1990, Ser. No. 584,510

Int. Cl.[5] C09D *167/02*

U.S. Cl. 524—539 **7 Claims**

1. An aqueous dispersion coating material containing, as a film-forming constituent, an aqueous dispersion prepared by a process comprising:

reacting a first resin consisting essentially of a carboxyl group-containing polyester resin capable of being rendered water-soluble when neutralized, said carboxyl group-containing polyester resin having an acid value of from 20 to 50, a hydroxyl value of from 50 to 200 and a number-average molecular weight of from 1,000 to

10,000, with a second resin consisting essentially of a hydrophobic linear polyester resin, said hydrophobic linear polyester resin being synthesized soley from a dicarboxylic acid constituent and a glycol constituent and having a softening point of from 40° C. to 200° C. and a number average molecular weight of from 10,000 to 100,000, said second resin containing a hydroxyl group or a carboxyl group only as a terminal group, said first resin being reacted with said second resin in a weight ratio of from 90:10 to 20:80 and at a temperature of from 150° C. to 200° C. in an ester-forming condensation reaction to form a resin reaction product having an acid value of from 10 to 30 and unesterified carboxyl groups;

neutralizing the resin reaction product with a base; and

emulsifying the neutralized resin reaction product in an aqueous medium to prepare said aqueous dispersion.

5,025,062

COATING MATERIALS BASED ON SYNTHETIC RESIN

Gregor Ley, Wattenheim; Wolfgang Schultze, Frankenthal; Johannes Vinke, Hockenheim, and Eckehardt Wistuba, Bad Durkheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 321,277, Mar. 9, 1989, abandoned. This application May 3, 1990, Ser. No. 518,337

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1988, 3809920

Int. Cl.[5] C08L *31/02*

U.S. Cl. 524—556 **12 Claims**

1. A stone chip composition, comprising:

5–15 wt. % of a polymer binder consisting of

(A) from 60 to 100% by weight of a mono-or di- tert-butyl ester of an α,β-ethylenically unsaturated carboxylic acid or dicarboxylic acid of not more than 5 carbon atoms or a mixture thereof,

(B) from 0 to 40% by weight of an acrylate or methacrylate of a nontertiary C_{1-20}-alkanol or a mixture thereof,

(C) from 0 to 20% by weight of vinyl chloride, vinyl acetate, vinyl propionate or mixtures thereof, wherein $m_C \leqq 0.5\ m_B$, wherein m_C and m_B are the amounts of monomers C and B respectively,

(D) from 0 to 10% by weight of acrylic acid, methacrylic acid, acrylamide, methacrylamide and mixtures thereof, and

(E) from 0 to 5% by weight of other copolymerizable monomers; and

50–80 wt. % of stone chips having a mean particle size of 1–4.5 mm wherein said binder is in the form of an aqueous dispersion.

5,025,063

IONOMERIC COATINGS

Gary P. Craun, Berea, and Barbara L. Kunz, Strongsville, both of Ohio, assignors to The Glidden Company, Cleveland, Ohio

Filed Aug. 23, 1989, Ser. No. 397,278

Int. Cl.[5] C08K *3/08, 3/22*

U.S. Cl. 524—560 **14 Claims**

1. A non-aqueous protective coating composition containing a thermosetting reactive polymeric binder, the binder comprising on a weight basis:

a carboxyl functional polymer having an Acid No. about 10 and a number average molecular weight between about 500 and 10,000, wherein the carboxyl functional polymer is an epoxy-ester copolymer comprising the reaction product of an epoxy resin with excess equivalents of dicarboyxlic acid comprising 1.3 to 4 equivalents of dicarboxylic acid per equivalent of epoxide, where said epoxy-ester copolymer contains hydroxyl group functionality and carboxyl group functionality; and

said coating composition being heat curable and said carboxyl polymer being self-curing to coreact said hydroxyl groups with said carboxyl groups to form a thermoset coating film.

5,025,064

PROCESS FOR THE PRODUCTION OF AQUEOUS POLYURETHANE DISPERSIONS

Helmut Reiff, Leverkusen, and Otto Lorenz, Roetgen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 3, 1990, Ser. No. 547,273

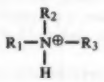
Claims priority, application Fed. Rep. of Germany, Jul. 8, 1989, 3922493

Int. Cl.[5] C08L *75/04*

U.S. Cl. 524—591 **10 Claims**

1. A process for the production of an aqueous dispersion of polyurethanes containing chemically incorporated carboxylate groups wherein the counterions to the carboxylate groups are predominantly ammonium ions corresponding to the formula

which comprises mixing a starting aqueous dispersion of polyurethanes containing chemically incorporated carboxylate groups wherein the counterions to the carboxylate groups comprise ammonium ions corresponding to the formula



wherein

R_1, R_2 and R_3 are the same or different and represent C_{1-4} alkyl groups, provided that the total number of carbon atoms in these substituents is 3 to 6,

with at least an equivalent quantity of ammonia, based on the trialkyl ammonium ions, and subsequently removing under vacuum at least a portion of the displaced trialkyl amines and the excess ammonia, if present.

5,025,065

FIRE-RETARDANT POLYCARBONATES AND POLYESTERS

Peter Tacke, Krefeld; Ulrich Grigo, Kempen; Werner Nouvertné, Krefeld; Dieter Freitag, Krefeld; Karsten-Josef Idel, Krefeld, and Uwe Westeppe, Mettmann, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

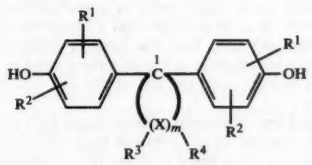
Filed Apr. 4, 1990, Ser. No. 504,487

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1989, 3911558

Int. Cl.[5] C08G *63/64;* **C08L** *69/00*

U.S. Cl. 524—611 **7 Claims**

1. A fire-retardant molding composition comprising a resin selected from the group consisting of polycarbonate, polyester carbonate and polyester, said resin being based on a dihydroxydiphenyl cycloalkane conforming to



in which

R^1 and R^2 independently of one another represent a hydro-

gen or a halogen atom, C_{1-8} alkyl, C_{5-6} cycloalkyl, C_{6-10} aryl or C_{7-12} aralkyl,

m is an integer of 4 to 7,

R^3 and R^4 are individually selected for each X and independently of one another denote a hydrogen atom or a C_{1-6} alkyl and,

X is carbon,

with the proviso that for at least one atom X, both R^3 and R^4 are alkyl radicals, the flame-retardant finish being provided by an additive or a comonomer.

5,025,066

POLYCARBONATE AND POLYESTER BLENDS MODIFIED WITH POLYORGANOSILOXANE GRAFT POLYMERS COMBINED WITH DIENE RUBBER-BASED GRAFT POLYMERS

James L. DeRudder, Mt. Vernon, Ind., and I-Chung W. Wang, Williamstown, Mass., assignors to General Electric Company, Pittsfield, Mass.

Filed Nov. 14, 1988, Ser. No. 271,246

Int. Cl.[5] C08G *63/47*; C08L *51/04*

U.S. Cl. 525—66 **34 Claims**

1. A composition comprising a polycarbonate resin (A); a mixture (A-1) comprising (i) a polycarbonate resin and (ii) a polyester resin; a mixture (A-2) comprising (i) a polycarbonate resin and (iii) a poly(etherester) elastomer, a poly(etherimide ester) elastomer or a mixture thereof; a mixture (A-3) comprising (i) a polycarbonate resin, (ii) a polyester resin and (iii) a poly(etherester) elastomer, a poly(etherimide ester) elastomer or a mixture thereof; or a mixture (A-4) of any of the foregoing; and

an effective low temperature ductility, gloss, impact resistance, discoloring, or thermal aging modifying amount of a modifier composition (B) comprising in combination

a multi-stage polyorganosiloxane-based graft polymer composition (B-1) comprising

(a) as a first stage, a substrate selected from

(i) an organosiloxane polymer, units derived from a cross-linking agent or agents and optionally units which serve as a graft-linking agent or agents;

(ii) a polymeric co-homopolymerized substrate comprised of, in combination, an organosiloxane polymer and at least one vinyl-based polymer;

(iii) a polymeric co-homopolymerized substrate comprised of, in combination, an organosiloxane polymer, at least one vinyl-based polymer, and units which are derived from a cross-linking agent or agents;

(iv) a polymeric co-homopolymerized substrate comprised of, in combination, an organosiloxane polymer, at least one vinyl-based polymer, and units which serve as a graft-linking agent or agents;

(v) a polymeric co-homopolymerized substrate comprised of, in combination, an organosiloxane polymer, at least one vinyl-based polymer, units which are derived from a cross-linking agent or agents and units from the same or different agent or agents which serve as a graft-linking agent or agents;

(vi) a polymeric co-homopolymerized substrate comprised of, in combination, an organo-siloxane polymer, at least one vinyl-based polymer, and a mixture of any of units which are derived from a cross-linking agent or agents, units which serve as a graft-linking agent or agents, or units derived from a cross-linking agent or agents and units from the same or different agent or agents which serve as a graft-linking agent or agents; or

(vii) a mixture of (i) and any of (ii), (iii), (iv), (v) or (vi); and

(b) at least one subsequent stage or stages graft polymerized in the presence of any previous stage and which is comprised of a vinyl-based polymer or a cross-linked vinyl-based polymer; and a diene rubber-based graft copolymer composition (B-2) comprising

(a) as a first stage a polymeric substrate comprised of units of a diene rubber and optionally units derived from a cross-linking agent or agents; and

(b) at least one subsequent stage graft polymerized in the presence of any previous stages and which is comprised of a vinyl-based polymer or a cross-linked vinyl-based polymer, the weight ratio of B-1 to B-2 being from 1 to 9:9 to 1.

5,025,067

PARTIALLY CURED EPOXY RESINS AND ELECTROSTATOGRAPHIC TONER CONTAINING THE SAME AS BINDER

Yohzoh Yamamoto; Goro Suzuki; Hideo Nakamura, and Kiyomi Yasuda, all of Chiba, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Nov. 16, 1988, Ser. No. 271,815

Claims priority, application Japan, Nov. 19, 1987, 62-292841; Nov. 20, 1987, 62-294795; Dec. 28, 1987, 62-333663

Int. Cl.[5] C08L *63/02*; C08G *59/14, 59/68*

U.S. Cl. 525—109 **2 Claims**

1. An epoxy resin having a softening point of 60 to 130° C. as measured by Durran's method, which is prepared by reacting:

(a) 100 parts by weight of at least one epoxy resin selected from the group consisting of bisphenol and hydrogenated bisphenol epoxy resins;

(b) an active hydrogen compound having at least three active hydrogen atoms capable of reacting with an epoxy group in its molecule in an amount of about 0.05 to about 0.35 equivalent of active hydrogen per equivalent of epoxy group in (a), said amount being capable of partially curing the epoxy group of said component (a); and

(c) about 5 to 40 parts by weight of an oligomer based on at least one main monomer selected from the group consisting of butadiene and isoprene, said oligomer having on average at least 1.5 equivalents of active hydrogen capable of reacting with an epoxy group in its molecule wherein components (b) and (c) are not identical.

2. An epoxy resin which is prepared by reacting

(a) 100 parts by weight of at least one epoxy resin selected from the class consisting of bisphenol and hydrogenated bisphenol epoxy resins,

(d) a bisphenol,

(e) at least one member selected from the class consisting of active hydrogen compounds and acid anhydrides having at least 3 equivalents of active hydrogen or acid anhydride group capable of reacting with an epoxy group in the molecule, and

(f) about 2 to about 30 parts by weight of an oligomer based on at least one main monomer selected from the class consisting of butadiene and isoprene, said oligomer having on average at least 1.5 equivalents of active hydrogen and/or acid anhydride group capable of reacting with an epoxy group in its molecule,

the amounts of components (d) and (e) being defined by the equations:

$$400 \leqq \frac{W(a) + W(d)}{W(a)/EqO(a) - W(d)/EqOH(d)} \leqq 900 \quad (1)$$

•

and

$$\alpha \geqq \frac{\gamma\rho}{1 - \gamma(1 - \rho)} \quad (2)$$

wherein

$$\alpha = \frac{1}{N(e) - 1}$$

$$\gamma = \frac{N(d) + N(e)}{N(a)}$$

-continued

$$\rho = \frac{N(e)}{N(d) + N(e)}, \text{ and}$$

wherein

W(a) and W(d) are the weight of components (a) and (d) respectively,

EqO(a) is an epoxy equivalent of component (a), and

EqOH(d) is an OH equivalent of component (d).

N(a), N(d), and N(e) are the average functionality per molecule of components (a), (d), and (e), respectively wherein components (d), (e) and (f) are not identical.

5,025,068

REACTING NOVOLAC AND BISPHENOL F EPOXY RESINS WITH CARBOXY-TERMINATED BUTADIENE-ACRYLONITRILE

Gilbert Garcia, Westchester, and Larissa Domnikov, Los Angeles, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 851,632, Apr. 14, 1986, abandoned. This application Feb. 3, 1988, Ser. No. 150,002

Int. Cl.[5] C08G *59/14;* **C08L** *63/10*

U.S. Cl. 525—119 **5 Claims**

1. A process for preparing an epoxy resin, comprising:

preparing a mixture consisting essentially of from about 72 to about 79 parts per hundred of a novolac epoxy resin having a functionality from about 2.5 to 6.0, from about 23 to about 16 parts per hundred of bisphenol F epoxy resin having a functionality of 2, and from about 3 to about 10 parts per hundred of carboxy-terminated butadiene acrylonitrile;

heating the mixture to a temperature of from about 290 to about 350 degrees Fahrenheit for a time sufficient to form a reaction product; and

cooling the reaction product to ambient temperature, whereby the resulting epoxy is curable at ambient temperature but has high elevated temperature strength when cured.

5,025,069

MILD ALKYL GLYCOSIDE-BASED DETERGENT COMPOSITIONS, FURTHER COMPRISING TERPENE AND ISOTHIAZOLONE DERIVATIVES

Katsuhiko Deguchi; Kozo Saito; Hiroyuki Saijo, and Masaki Tosaka, all of Utsunomiya, Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Dec. 6, 1989, Ser. No. 446,815

Claims priority, application Japan, Dec. 19, 1988, 63-319906; Jan. 9, 1989, 1-2570

Int. Cl.[5] C11D *1/83, 1/66, 3/18, 3/28*

U.S. Cl. 252—174.17 **4 Claims**

1. A detergent composition comprising:

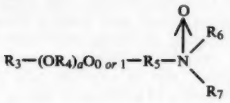
(a) 1–60% by weight of an alkyl glycoside represented by formula (I):

$$R_1(OR_2)_xG_y \quad (I)$$

wherein R_1 is a linear or branched alkyl, alkenyl, or alkylphenyl group having 8 to 18 carbon atoms, R_2 is an alkylene group having 2 to 4 carbon atoms, G is a moiety derived from a reducing saccharide containing 5 to 6 carbon atoms, x is an average value of 0–5, and y is an average value of 1.0–1.42;

(b) 0.1–40% by weight of a surface active agent comprising a sulfate group, sulfonate group, or both;

(c) 0.1–10% by weight of an amine oxide represented by formula (II):



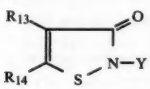
(II)

wherein R_3 is a linear or branched alkyl or alkylamide group having 8 to 18 carbon atoms, R_4 is an alkylene group having 2 to 3 carbon atoms, a is a number from 0–30, R_5 is an alkylene group having 0 to 5 carbon atoms, and R_6 and R_7, which may be the same or different, are each a member selected from the group consisting of alkyl groups having 1 to 12 carbon atoms, alkanol groups having 1 to 3 carbon atoms, $-(C_2H_4O)_{1-6}H$ groups, and mixtures thereof,

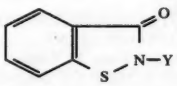
(d) 0.1–10% by weight of an ethoxylated nonionic surface active agent; wherein the ratio by weight of [(b)+(c)]/(a) is in the range of 1/25–10/1 and the ratio by weight of (c)/(b) is 1/10–3/1;

(e) 0.01–3% by weight of a terpene hydrocarbon selected from the group consisting of monoterpenes and sesquiterpenes, and

(f) 0.0001–0.1% by weight of one or more 3-isothiazolones represented by formulae (VI) and (VII), or their derivatives,



(VI)



(VII)

wherein R_{13} and R_{14}, individually, are a hydrogen atom, a halogen atom, or an alkyl group having 1 to 5 carbon atoms, and Y is a hydrogen atom or an alkyl group having 1 to 18 carbon atoms.

5,025,070

COPOLYMER POLYAMIDE RESIN FROM HYDROGENATED POLYOLEFIN CONDENSATE

Hajime Suzuki, Himeji, Japan, assignor to Daicel Chemical Industries Co., Ltd., Sakai, Japan

Continuation of Ser. No. 785,937, Oct. 9, 1985, abandoned, which is a division of Ser. No. 651,633, Sep. 14, 1984, Pat. No. 4,555,566, which is a continuation of Ser. No. 440,215, Oct. 12, 1982, abandoned. This application Jul. 17, 1986, Ser. No. 888,095

Claims priority, application Japan, Mar. 16, 1981, 56-38374; Jun. 30, 1981, 56-102047; Mar. 9, 1982, 57-36910

Int. Cl.[5] C08G *69/26, 69/08, 69/48*

U.S. Cl. 525—184 **4 Claims**

1. A polyamide-modified, hydrogenated polyolefin, block copolymer resin which consists essentially of (A) 99 to 5 parts by weight of a polyamide component consisting essentially of repeating units selected from the group consisting of (1) $-NH(CH_2)_nCO-$, wherein n is an integer of from 5 to 11, and (2) —NH—X—NHCO—Y—CO, wherein X is $-C_mH_{2m}-$ in which m is an integer of from 6 to 12, isophorone, phenylene or cyclohexylene, and Y is $-C_lH_{2l}-$ in which l is an integer of from 4 to 10, phenylene, or cyclohexylene, copolymerized with (B) 1 to 95 parts by weight of blocks consisting essentially of a hydrogenated polyolefin condensate; said hydrogenated polyolefin blocks being derived from a condensation reaction of (3) hydrogenated polyolefin having a pair of terminal carboxylic acid groups or amino groups and derived from an olefin monomer having at least two double bonds, with (4) (i)

a diamine when said hydrogenated polyolefin has terminal carboxylic acid groups or (ii) a dicarboxylic acid when said polyolefin has terminal amino groups, said diamine being selected from the group consisting of hexamethylenediamine, dodecamethylenediamine, cyclohexanediamine, phenylenediamine and isophoronediamine, said dicarboxylic acid being selected from the group consisting of adipic acid, sebacic acid, dodecanedioic acid, alicyclic dicarboxylic acids and aromatic dicarboxylic acids, said hydrogenated polyolefin blocks having a number-average molecular weight in the range of 500 to 10,000 and having a double bond hydrogenation ratio of greater than 70%, said block copolymer resin having a number-average molecular weight in the range of 5,000 to 500,000.

5,025,071

CROSSLINKABLE SILYL POLYMER COMPOSITION

David J. Bullen, Hackettstown, N.J., assignor to BP Chemicals Limited, London, England

Filed Jul. 5, 1989, Ser. No. 375,819

Claims priority, application United Kingdom, Jul. 13, 1988, 8816657

Int. Cl.[5] C08F *8/00*

U.S. Cl. 525—326.5 **8 Claims**

1. A composition capable of being crosslinked by the action of water which comprises;

(A) a silyl polymer which is an ethylene polymer containing hydrolyzable silane groups

(B) an ester of a linear dibasic acid having from 4 to 14 carbon atoms and a branched alcohol having from 4 to 14 carbon atoms and,

(C) an organometallic silanol condensation catalyst.

5,025,072

HIGHLY ACTIVE CATALYST COMPOSITION FOR POLYMERIZING ALPHA-OLEFINS

Thomas E. Nowlin, Kendall Park, and Klaus P. Wagner, East Windsor, both of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Division of Ser. No. 633,991, Jul. 24, 1984, Pat. No. 4,605,638, which is a division of Ser. No. 444,152, Nov. 24, 1982, Pat. No. 4,481,301, which is a continuation-in-part of Ser. No. 327,534, Dec. 4, 1981, abandoned. This application Nov. 22, 1985, Ser. No. 800,841

Int. Cl.[5] C08F *4/608, 4/648, 210/02*

U.S. Cl. 526—129 **27 Claims**

1. A process for preparing a linear low density ethylene/alpha-olefin copolymer having a density of 0.94 g/cc or less comprising conducting the polymerization in the presence of a catalyst prepared by a process consisting essentially of the steps of:

(i) contacting a solid, porous carrier having reactive OH groups with a liquid, said liquid containing at least one organomagnesium composition having the empirical formula

$$R_nMgR'_{(2-n)} \quad (I)$$

where R is a C_1–C_{12} hydrocarbyl group, R′ is a halogen, and n is 1, the number of moles of said organomagnesium composition being in excess of the number of moles of said OH groups on said carrier, whereby said organomagnesium composition is reacted with said OH groups on said carrier;

(ii) evaporating said liquid from step (i) to obtain a carrier, containing magnesium, in the form of a dry, free-flowing powder;

(iii) reacting said powder of step (ii) with at least one transition metal compound in a liquid medium, the number of moles of said transition metal compound being in excess of the number of said OH groups on said carrier prior to the reaction of said carrier with said organomagnesium composition in step (i), said transition metal compound being soluble in said liquid medium, and the magnesium being substantially insoluble in said liquid medium, whereby a reacted form of transition metal which is insoluble in said liquid medium becomes supported on said carrier; and

(iv) combining the product of step (iii) with a metal alkyl activator.

5,025,073

ONE PART HEAT CURABLE ORGANOPOLYSILOXANE COMPOSITIONS

Larry N. Lewis, Scotia, and Chris A. Sumpter, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 19, 1989, Ser. No. 424,022

Int. Cl.[5] C08G *77/06*

U.S. Cl. 528—15 **6 Claims**

1. One part heat curable organoplysiloxane compositions comprising by weight:

(A) 100 parts of a vinyl-substituted organopolysiloxane fluid,

(B) 1 to 20 parts of a siloxane hydride and

(C) an amount of an inclusion compound of a cyclodextrin and a complex of a platinum halide and a member selected from a cyclooctadiene or a norbornadiene which is effective as a latent platinum catalyst.

5,025,074

FLAME RETARDANT ORGANOPOLYSILOXANE-POLYCARBONATE TRIBLOCK COPOLYMERS

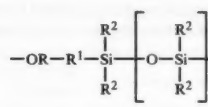
Gary C. Davis; Barbara E. McGrath, both of Albany, and Kevin M. Snow, Clifton Park, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 27, 1990, Ser. No. 572,283

Int. Cl.[5] C08G *77/06*

U.S. Cl. 528—15 **11 Claims**

1. A flame retardant organopolysiloxanepolycarbonate triblock copolymer comprising an aromatic polycarbonate having terminal groups of the formula,



where R is a $C_{(6-20)}$ divalent aromatic organic radical, R^1 is a $C_{(2-8)}$ aliphatic organic radical, R^2 is a $C_{(1-13)}$ monovalent hydrocarbon radical or a $C_{(1-13)}$ monovalent hydrocarbon radical substituted with radicals inert during equilibrium or condensation, R^3 is a $C_{(1-13)}$ monovalent organic radical and n is an integer equal to 0 to 100 inclusive.

5,025,075

METHYLPOLYSILANES AND METHOD FOR THEIR PREPARATION

Gary T. Burns, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Jul. 22, 1988, Ser. No. 222,897

The portion of the term of this patent subsequent to Jun. 11, 2008, has been disclaimed.

Int. Cl.[5] C08G *77/04*

U.S. Cl. 528—33 **21 Claims**

1. A process for the preparation of an alkoxy-functional methylpolysilane comprising the steps of:

(a) heating a mixture of alkoxydisilanes containing two, three, and four alkoxy-functional groups bonded to the silicon atoms, in the presence of a catalyst which is a source of alkoxide ions to form a reaction mixture:

(b) reacting said mixture for a time sufficient for an alkoxy-functional methylpolysilane to form while separating by-produced volatile alkoxysilane materials from said reaction mixture; and

(c) separating said catalyst from said alkoxy-functional methylpolysilane which has formed.

5,025,076

SILICONE-BASED FABRIC FINISHING AGENT

Masaki Tanaka; Hiroshi Ohashi, and Yoshinobu Takahashi, all of Gunma, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Feb. 27, 1989, Ser. No. 315,879
Claims priority, application Japan, Feb. 27, 1988, 63-45352
Int. Cl.[5] C08G *77/04*
U.S. Cl. 528—33 6 Claims

1. A silicone-based fabric finishing agent which comprises, in admixture:

(A) from 50 to 95 parts by weight of a diorganopolysiloxane having a viscosity in the range from 10,000 to 1,000,000 centistokes at 25° C. and having a substantially linear molecular structure represented by the general formula

$$XO-(-SiR_2-O-)_m-(-SiZR-O-)_n-X,$$

in which each R is a monovalent hydrocarbon group having 1 to 20 carbon atoms, Z is an amino-substituted alkyl group represented by the general formula $-R^1-(-NH-CH_2CH_2-)_a-NR^2_2$, R^1 being an alkylene group having 1 to 10 carbon atoms, each R^2 being a hydrogen atom or a monovalent hydrocarbon group and the subscript a being zero or a positive integer not exceeding 4, each X is a hydrogen atom or a monovalent hydrocarbon group having 1 to 10 carbon atoms, the subscript m is a positive integer in the range from 800 to 2000 and the subscript n is a positive integer not exceeding 20 with the proviso that $n/(m+n)$ is in the range from 0.0005 to 0.01;

(B) from 5 to 50 parts by weight of an organopolysiloxane which is a reaction product of

(B-a) an aminoalkyl-containing organopolysiloxane represented by the average unit formula

$$Z_bR_cSiO_{(4-b-c)/2},$$

in which Z and R each have the same meaning as defined above, the subscript b is a positive number not exceeding 1 and the subscript c is a positive number not exceeding 2 with the proviso that $b+c$ is in the range from 1.9 to 2.1, and

(B-b) an epoxy-containing organic compound in an amount to provide from 0.01 to 20 moles of epoxy groups per mole of the amino-substituted alkyl groups denoted by Z in the reactant (B-a);

(C) up to 30 parts by weight of an aminoalkyl-containing organopolysiloxane having a viscosity in the range from 100 to 5,000 centistokes at 25° C. and represented by the average unit formula

$$Z_bR_cSiO_{(4-b-c)/2},$$

in which each symbol has the same meaning as defined above; and

(D) a hydrolysis product of an epoxy-containing hydrolyzable organosilane compound in an amount in the range from 1 to 50% by weight based on the total amount of the components (A), (B) and (C).

5,025,077

COMPOSITION FOR GLUING DISCONTINUOUS MINERAL FIBERS IN ORDER TO OBTAIN INSULATION PRODUCTS

Serge Tetart, Nogent sur Oise, and Bernard Lericque, Rantigny, both of France, assignors to Isover Saint-Gobain, Courbevoie, France

Filed Jul. 28, 1988, Ser. No. 226,202
Claims priority, application France, Aug. 3, 1987, 87 10978
Int. Cl.[5] C08G *59/00*
U.S. Cl. 528—86 13 Claims

1. A base aqueous composition for gluing discontinuous mineral fibers comprising (a) at least one heat hardenable resin, (b) urea and (c) a polymethylol compound having a functionality of at least equal to three, wherein the polymethylol has the formula:

$$R-C(CH_2OH)_3 \text{ or}$$

$$R-C(CH_2OH)_2\ CH_2-O-CH_2-(CH_2OH)_2-CR-R'$$

where R and R', which may be identical or different, each represent a hydrocarbon aliphatic radical which may or may not contain a hydroxyl group and is selected from the group consisting of pentaerythritol, dipentaerythritol, trimethylolpropane, ditrimethylolpropane and mixtures thereof.

5,025,078

EPOXY RESIN SYSTEMS CONTAINING METHYL-2,6,-CYCLOHEXANEDIAMINE

Peter A. Lucas, Allentown, and Jeremiah P. Casey, Emmaus, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Feb. 2, 1990, Ser. No. 475,470
Int. Cl.[5] C08G *59/50*
U.S. Cl. 528—120 7 Claims

1. In a polyepoxide resin composition comprising a glycidyl ether of a polyhydric phenol, glycidyl polyester or glycidyl amine cured with an amine curing agent, the improvement which comprises utilizing as said curing agent, or component thereof, 1-methyl-2,6-cyclohexanediamine.

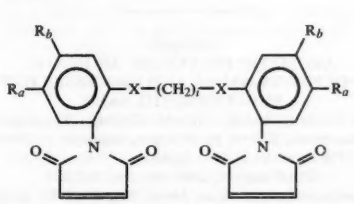
5,025,079

ORTHO-ORTHO ARAMATIC BIS MALEIMIDE-DIAMINE RESIN

Joseph J. Zupancic, Bensenville; Raymond J. Swedo, Mt. Prospect, both of Ill.; Donald R. Jamieson, Merriam, Kans.; Elaine F. Schumacher, Arlington Hts., and Allyson J. Buehler, Indiana Hd. Pk., both of Ill., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Jul. 10, 1989, Ser. No. 377,507
Int. Cl.[5] C08G *73/12*
U.S. Cl. 528—170 4 Claims

1. A thermosetting resin reaction product of (a) a bismaleimide having the formula:



where

R_a and R_b are independently selected from hydrogen, an alkyl or alkoxy group containing up to 4 carbon atoms, chlorine, or bromine, or R_a and R_b together form a fused 6-membered hydrocarbon aromatic ring, with the proviso

that R_a and R_b are other than t-butyl or t-butoxy and where

X is O, S, or Se

i is 1–3

and the alkylene bridging group —$(CH_2)_i$— is optionally substituted by 1–3 methyl groups or by fluorine, with (b) a diamine.

5,025,080

RESIN COMPOSITION FROM DI(ARYLCYCLOBUTENEALKYL) ETHER OF DI(HYDROXYPHENYL) OLIGOMER

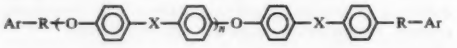
Puk K. Wong, Katy, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Mar. 30, 1990, Ser. No. 503,413

Int. Cl.[5] C08G *73/10*

U.S. Cl. 528—170 **15 Claims**

1. A curable resin composition comprising an organic dicyanate, a bismaleimide and a di(arylcyclobutenealkyl) ether of di(hydroxyphenyl) oligmer of the formula



wherein Ar is an aromatic ring system of up to 4 aromatic rings and up to 30 carbon atoms inclusive connected to R from a carbon atom of a six-membered ring, R is alkylene of up to 4 carbon atoms inclusive, X is a direct valence bond or X is alkylene of up to 8 carbon atoms inclusive, oxy, thio, sulfonyl, carbonyl or carbonato and n is an average number from 0 to about 20.

5,025,081

PREPARATION OF POLYESTERCARBONATE FROM ALIPHATIC DICARBOXYLIC ACID

Luca P. Fontana, Evansville, and Paul W. Buckley, Mt. Vernon, both of Ind., assignors to General Electric Company, Mt. Vernon, Ind.

Continuation-in-part of Ser. No. 455,067, Dec. 22, 1989, abandoned. This application Jan. 30, 1990, Ser. No. 476,067

Int. Cl.[5] C08G *63/64*

U.S. Cl. 528—176 **12 Claims**

1. A process for preparing a copolyestercarbonate which comprises reacting interfacially a dihydric phenol, a carbonate precursor, and an aliphatic alpha omega dicarboxylic acid having from 9 to about 20 carbon atoms wherein the said diacid is from about 2 to about 20 mole percent based on the dihydric phenol reactant content and wherein the initial pH is from about 8 to about 9 for about 70 to about 95% of the carbonate precursor addition time period and is then raised to a final pH of from about 10 to 12 for the remainder of the carbonate precursor addition time period.

5,025,082

AROMATIC POLYESTER, AROMATIC POLYESTER-AMIDE AND PROCESSES FOR PRODUCING THE SAME

Osamu Kishiro, Atsugi; Hiroshi Kamata, Yokohama, and Hideko Sakai, Tokyo, all of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

Filed Aug. 18, 1989, Ser. No. 395,683

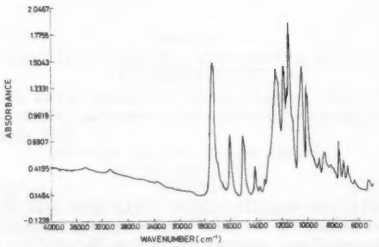
Claims priority, application Japan, Aug. 24, 1988, 63-210155; Oct. 11, 1988, 63-255590; May 9, 1989, 1-115829

Int. Cl.[5] C08G *63/02, 63/18*

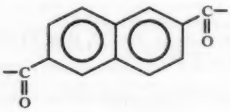
U.S. Cl. 528—190 **10 Claims**

1. An aromatic polyester which consists essentially of

(a) 3 to 15 mole % of 2,6-naphthalenedicarboxylic acid unit represented by the formula (1):



(1)

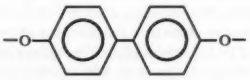


(b) 7 to 25 mole % of terephthalic acid unit represented by the formula (2):

(2)

(c) 4 to 30 mole % of 4,4,'-dihydroxydiphenyl unit represented by the formula (3):

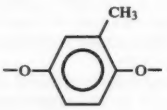
(3)



(d) 3 to 25 mole % of at least one member selected from the group consisting of aromatic diol units represented by the following formulae (4) and (5):

(4)

(5)



and

(e) 40 to 70 mole % of p-hydroxybenzoic acid represented by the formula (9):

(9)

wherein when molar numbers of the above constitutional units represented by (1), (2), (3), (4), (5) and (9) are represented by {1}, {2}, {3}, {4}, {5}, and {9}, respectively, the mole % is a value based on

{1}+{2}+{3}+{4}+{5}+{9} and satisfies the following mathematical equation:

$$0.1 < \frac{\{4\} + \{5\}}{\{3\}} < 10$$

and has a soldering resistance at 260° C. for 10 sec and a melt viscosity of 10 poise or more at 320° C. and 100 sec^{-1}.

5,025,083

PROCESS FOR PREPARATION OF POLYCARBONATE

Mitsuru Ueda, Yamagata; Tatsuya Kanno, Hyogo; Yoshihiro Iguchi, Hyogo, and Yasuhiro Oshino, Hyogo, all of Japan, assignors to Daicel Chemical Industries, Ltd., Sakai, Japan

Continuation-in-part of Ser. No. 423,336, Oct. 18, 1989, abandoned. This application Feb. 2, 1990, Ser. No. 475,206

Claims priority, application Japan, Feb. 10, 1989, 1-31904; Jun. 23, 1989, 1-161039; Oct. 26, 1989, 1-279048

Int. Cl.[5] C08G *64/28, 64/30*

U.S. Cl. 528—199 **5 Claims**

1. A process for preparing a polycarbonate comprising melt-polycondensing (A) at least one dihydric phenol with a co-monomer selected from the group consisting of (B) bisphenyl carbonate, (C) bis(2,4,6-trichlorophenyl) carbonate, (D) bis(2,4-dichlorophenyl) carbonate and (E) bis(2-cyanophenyl) carbonate in the presence of a catalyst selected from among electron-donating amine compounds or salts thereof, with the proviso that said salt is other than a chloride.

5,025,084

POLYIMIDE-FORMING COMPOSITIONS

Bryan Dobinson, Duxford, and Mark R. Southcott, Chatteris, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 10, 1990, Ser. No. 550,429

Claims priority, application United Kingdom, Jul. 15, 1989, 8916259

Int. Cl.[5] C08G *12/00*

U.S. Cl. 528—229 **22 Claims**

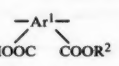
1. A polyimide-forming composition comprising

(A) a polycarboxylic acid partial ester of formula

$$HOOC—R^1—COOR^2 \quad I$$

where R^1 denotes a divalent ethylenically unsaturated aliphatic or cycloaliphatic group of 2 to 20 carbon atoms, and R^2 denotes the residue, after removal of a hydroxyl group, of an alcohol having from 4 to 20 carbon atoms which has a cycloaliphatie, aromatic or heterocyclic ring and is polymerisable on heating in the presence of an acid,

(B) a partial ester of formula I above in which R^1 denotes a group of formula II



II

where Ar^1 denotes a tetravalent aromatic group of 6 to 20 carbon atoms linked through aromatic carbon atoms thereof to the indicated carbon atoms, and R^2 is as defined above,

(C) an aromatic primary polyamine and

(D) a heat-activable substance which releases an acid at a temperature of 100° C. or above.

5,025,085

CURABLE AMINOPLAST COMPOSITIONS AND CATALYSTS FOR CURING SAME

Carlos A. Piedrahita, Mentor; Robert E. Quinn, Cleveland, and John S. Perz, Mentor, all of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Filed Nov. 6, 1989, Ser. No. 432,233

Int. Cl.[5] C08L *61/28*

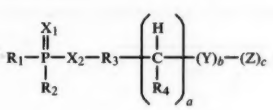
U.S. Cl. 528—230 **51 Claims**

1. A curable composition comprising:

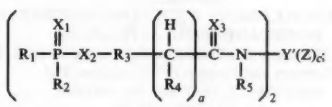
(A) at least one aminoplast resin; and

(B) an amount effective to cure the composition of at least one catalyst selected from the group consisting of

(B-1) an acid, or an anhydride, ester, ammonium salt or metal salt of the acid that is represented by one of the formulae

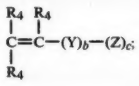


(I)



(II)

(B-2) an acid, or an ester, a metal salt or ammonium salt of a sulfo compound represented by the formula:



(III)

(B-3) an acid, or an ammonium or metal salt of a reaction product of at least one amine and the sulfo compound of (B-2); and mixtures thereof;

where in Formulae I and II

R_1 and R_2 are each independently hydrocarbyl or hydrocarbyloxy or hydrocarbylthio groups;

where in Formulae I, II and III

each X_1 and X_2 is independently sulfur or oxygen;

R_3 is a divalent hydrocarbyl group,

each R_4 and R_5 is independently a hydrogen or hydrocarbyl group;

a is 0 or 1;

b is 0 or 1;

c is 1 or 2;

Y is a divalent or trivalent hydrocarbyl group or $—C(X_3)NR_5Y'$;

X_3 is sulfur or oxygen;

Y' is a divalent, trivalent or tetravalent hydrocarbyl group provided that Y' is not divalent in Formula II;

Z is —S(O)OH, or $—S(O)_2OH$.

5,025,086

NOVEL TRIFUNCTIONAL MONOMER COMPOUNDS, POLYESTERS DERIVED THEREFROM AND THERMOSETTING COATING COMPOSITIONS CONTAINING THE POLYESTERS

William W. Blount, Jr., and Joseph R. Zoeller, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

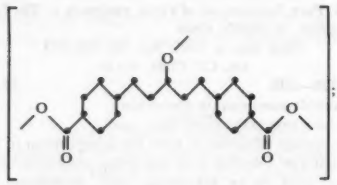
Filed Nov. 13, 1990, Ser. No. 612,154

Int. Cl.[5] C08G *63/02*

U.S. Cl. 528—272 **5 Claims**

1. A curable polyester comprising

(1) about 1 mole percent to about 20 mole percent of a residue of the formula



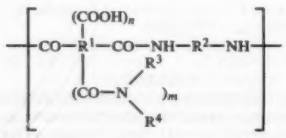
(2) diol and/or polyol residues; and
(3) dicarboxylic acid residues.

5,025,087
66 NYLON FILAMENT WITH LOW CONTENT OF DODECANE DIOIC ACID UNITS
Franklin P. Williams, III, Columbia, S.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Feb. 13, 1990, Ser. No. 493,840
Int. Cl.[5] C08G *69/26*
U.S. Cl. 528—339 1 Claim

1. Filament of nylon 66 polymer having a content of about 50 to about 150 parts per million dodecanedioic acid units therein, said content based on total polymer weight, whereby said filament has improved dyeability.

5,025,088
PHOTOSENSITIVE POLY(AMIDE)IMIDE HEAT-RESISTANT POLYMER
Hirotoshi Maeda, Yokohama, and Kouichi Kunimune, Ichihara, both of Japan, assignors to Chisso Corporation, Osaka, Japan
Continuation of Ser. No. 329,727, Mar. 28, 1989, abandoned. This application Jul. 19, 1990, Ser. No. 554,434
Claims priority, application Japan, Nov. 4, 1988, 63-886112
Int. Cl.[5] C08G *69/26;* G03C *1/725*
U.S. Cl. 528—353 1 Claim

1. A photosensitive polymer having an inherent viscosity of 0.1 to 5 dl/g when measured in a solvent at a temperature of 30±0.01° C. at a concentration of 0.5 g/dl and containing a repeating unit represented by the general formula (I):



(I)

wherein R^1 is independently a trivalent or tetravalent carbon cyclic aromatic group or heterocyclic group; R^2 is independently an aliphatic group having at least 2 carbon atoms, an alicyclic group, an aromatic aliphatic group, a carbon cyclic aromatic group, a heterocyclic group or a polysiloxane group; R^3 and R^4 are CH_2—CH=CH_2; m is 1 o 2; n is 0 or 1; and m and n satisfy $1 \leqq m+n \leqq 2$.

5,025,089
COPOLYIMIDES DERIVED FROM 2,2-BIS (AMINO PHENYL) HEXAFLUOROPROPANE
Rohitkumar H. Vora, Westfield, and Paul N. Chen, Sr., Gillette, both of N.J., assignors to Hoechst Celanese Corp., Somerville, N.J.
Continuation-in-part of Ser. No. 217,928, Jul. 12, 1988, Pat. No. 4,978,737. This application Nov. 13, 1989, Ser. No. 434,148
Int. Cl.[5] C08G *69/26*
U.S. Cl. 528—353 17 Claims

1. A polyimide polymer soluble in N-methylpyrrolidone comprising the imidized condensation product of a mixture of diamines comprising:
(a) a diamine selected from the group consisting of 2, 2-bis(3-aminophenyl) hexafluouropropane and 2,2-bis(4-aminophenyl) hexafluoropropane;
(b) a second diamine having the formula H_2N—R—NH_2 wherein R is a divalent aromatic radical comprising a phenylene, napthalene or bis-phenlene group; and a mixture of dianhydrides comprising:
(c) pyromellitic dianhydride; and
(d) at least one additional dianhydride selected from the groups consisting of bis (3,4-dicarboxyphenyl) ether dianhydride, 3,3′, 4,4′ benzophenone tetracarboxylic dianhydride, 3,3′, 4,4′ diphenyl tetracarboxylic acid dianhydride and 2,2 bis (3,4 dicarboxy phenyl) hexafluoropropane dianhydride, the relative proportions of said dianhydrides present in the mixture being from about 35 to about 75 mole percent of (c) and from about 25 to about 65 mole percent of (d), and the relative molar proportion of said diamine (a) and said diamine (b) being in the range of from about 3:1 to 1:3 respectively.

5,025,090
DECOLORIZATION OF DIHYDROXYDIPHENYL SULFONE
Henry J. Barda, Brunswick, N.J., assignor to AKZO NV, Arnhem, Netherlands
Filed Feb. 1, 1990, Ser. No. 473,482
Int. Cl.[5] C07C *315/04*
U.S. Cl. 568—33 9 Claims

1. A process for the production of a less colored dihydroxydiphenyl sulfone by reaction of phenol with a sulfonating agent or phenol sulfonic acid wherein the improvement comprises adding an effective amount of a trivalent phosphorus compound for color reduction during the reaction.

5,025,091
POLYMERIZATION OF CO/OLEFIN WITH HYDROCARBYL-PD HALIDE/BIDENTATE P LIGAND CATALYST COMPLEX
Petrus W. N. M. van Leeuwen, and Cornelis F. Roobeek, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.
Filed Jan. 17, 1990, Ser. No. 466,559
Claims priority, application Netherlands, Jan. 26, 1989, 8900184
Int. Cl.[5] G08G *67/02*
U.S. Cl. 528—392 12 Claims

1. A process for the production of linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon by contacting the carbon monoxide and hydrocarbon under polymerization conditions in the presence of a reaction diluent and a catalyst complex comprising an equimolar complex of a hydrocarbylpalladium halide and a bidentate phosphorus ligand.

5,025,092

POLYMERIZATION OF CARBON MONOXIDE WITH ETHYLENICALLY UNSATURATED ALCOHOL

Eit Drent, and Anthonius J. M. Breed, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 18, 1989, Ser. No. 451,920

Claims priority, application United Kingdom, Dec. 29, 1988, 8830334

Int. Cl.[5] C08G *67/02*

U.S. Cl. 528—392 9 Claims

1. A process for producing a polymer by reacting an ethylenically unsaturated alcohol of up to 30 carbon atoms inclusive, wherein the alcohol has at least 4 carbon atoms between the hydroxyl and the ethylenic moiety, with carbon monoxide in an inert aprotic reaction diluent at a temperature below 140° C. and in the presence of a catalyst composition formed from a palladium salt, a tertiary aromatic monophosphine, and an oxygen-containing acid having a pKa below 2, with or without a bidentate phosphorus ligand, wherein the molar ratio of total phosphine to palladium is less than 10 and the molar ratio of acid to total phosphine is less than 1.

5,025,093

PYROLYSIS OF PERFLUOROPOLYETHERS

Richard J. Lagow, Georgetown; Thomas R. Bierschenk; Timothy J. Juhlke, both of Round Rock, and Hajimu M. Kawa, Austin, all of Tex., assignors to Exfluor Research Corporation, Austin, Tex.

Continuation of Ser. No. 92,465, Sep. 3, 1987, Pat. No. 4,894,484, which is a continuation-in-part of Ser. No. 796,624, Nov. 8, 1985, abandoned. This application Jan. 5, 1990, Ser. No. 461,543

The portion of the term of this patent subsequent to Jan. 16, 2007, has been disclaimed.

Int. Cl.[5] C07C *41/01, 41/48*

U.S. Cl. 568—601 12 Claims

1. A method of cleaving perfluoropolyethers to lower molecular weight fragments, comprising the steps of:

(a) pyrolyzing a perfluoropolyether at a temperature above about 350° C. to cleave the perfluoropolyether into lower molecular weight linear perfluoropolyethers, in the absence of a metal oxide or metal fluoride catalyst;

(b) condensing and collecting vaporized lower molecular weight linear perfluoropolyethers; and

(c) treating the collected linear perfluoropolyethers with fluorine gas to eliminate acyl fluoride end groups and any unsaturation of the collected perfluoropolyethers.

5,025,094

HETEROGENEOUS ALKOXYLATION USING ANION-BOUND METAL OXIDES

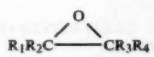
Stephen W. King, Charleston, W. Va., assignor to Union Carbide Chemicals and Plastics Technology Corporation, Danbury, Conn.

Division of Ser. No. 119,690, Nov. 12, 1987, Pat. No. 4,873,017, which is a division of Ser. No. 753,543, Jul. 10, 1985, Pat. No. 4,727,199. This application Jun. 13, 1989, Ser. No. 365,359

Int. Cl.[5] C07C *41/03*

U.S. Cl. 568—623 12 Claims

1. Process comprising reacting at least one molecule of a liquid or solid epoxide compound having the formula:



wherein R_1, R_2, R_3 and R_4 are each H or $-(CH_2)_nCH_3$, and wherein n is 0 to 3, with the proviso that R_1, R_2, R_3 and R_4 are the same or different, with at least one other molecule of said epoxide compound in the presence of catalytic amount of at least one solid anion-bound metal oxide heterogeneous catalyst, wherein said anion in said anion-bound metal oxide heterogeneous catalyst is SO_4, BF_4, CO_3, BO_3, HPO_4, SeO_4, MoO_4, B_4O_7 or PF_6, and the metal oxide is zirconium oxide, nickel oxide, aluminum oxide, tin oxide, magnesium oxide, iron oxide, titanium oxide, thorium oxide, hafnium oxide or rubidium oxide, said anion-bound metal oxide heterogeneous catalyst being an amorphous or primarily amorphous compound, and said molecules of said epoxide compound being the same epoxide compound or different epoxide compounds.

5,025,095

SUBSTITUTED DIALLYLPHENOL DERIVATIVES AS REACTIVE DILUENTS FOR BISMALEIMIDES

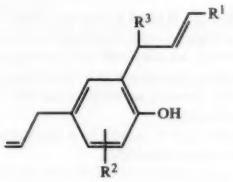
Yefim Blyakhman, Bronx, N.Y., and Byung H. Lee, Easton, Conn., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 467,092, Jan. 18, 1990, abandoned. This application Oct. 12, 1990, Ser. No. 597,278

Int. Cl.[5] C07C *43/78*

U.S. Cl. 568—652 20 Claims

1. A substituted diallylphenol of the formula (I)



wherein R^1 is hydrogen, C_1–C_{20}alkyl or aryl, R^2 is C_1–C_{20}alkyl, aryl or OR^4 wherein R^4 is C_1–C_{20}alkyl or aryl and R^3 is hydrogen, C_1–C_{20}alkyl or aryl with the proviso that when R^2 is methoxy, one of R^1 and R^3 is not hydrogen.

5,025,096

PREPARATION OF INDOLE AND INDOLE DERIVATIVES

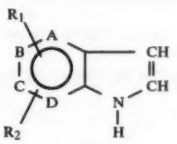
Kuen-Wai Chiu, Mars; Lin-Chen Yu, Allison Park, and John R. Strickler, Pittsburgh, all of Pa., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed Aug. 22, 1985, Ser. No. 768,461

Int. Cl.[5] C07D *491/56, 209/8*

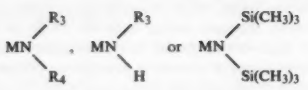
U.S. Cl. 544—234 8 Claims

1. A method of preparing indole and derivatives thereof of the formula



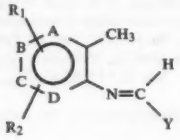
wherein not more than two of A, B, C, and D are nitrogen atoms and the remainder are carbon atoms; wherein R_1 and R_2 are independently a hydrogen atom, a halogen atom, a lower alkyl group, a lower alkoxy group, a hydroxymethyl group, an amino group, a mono-lower alkylamino group, a di-lower alkylamino group, a phenyl group or substituted phenyl group having a halogen, trifluoromethyl, lower alkyl, lower alkoxy, nitro, amino, lower alkylamino, or di-lower alkylamino substitutent, a phenoxy group or substituted phenoxy group having a halogen, trifluoromethyl, lower alkyl, lower alkoxy, nitro, amino, lower alkylamino, or di-lower alkylamino substituent, or a di-lower alkoxymethyl group, or R_1 and R_2 together are a lower alkylenedioxy group on adjacent carbon atoms,

which comprises the step of contacting an alkali metal amide of the formula



wherein M is an alkali metal and R_3 and R_4 are independently a lower alkyl group, a cycloalkyl group or R_3 and R_4 are a lower alkylene group;

with a formimidate derivative of the formula



wherein A, B, C, D, R_1 and R_2 are as defined above and Y is an alkoxy group, an aryloxy group, an alkylthio group, an arylthio group, an alkylsulfonyl group, or an arylsulfonyl group, at a temperature between about −30° C. and 150° C., thereby forming an alkali metal salt of said indole or derivative thereof,

and converting the salt to indole or a derivative thereof by reaction with water or alcohol.

5,025,097

4-CHLOROOXAZOLE DERIVATIVES AND PROCESSES FOR THEIR PREPARATION AND USE

Rainer Wingen, Hattersheim; Dieter Guenther, Kelkheim, and Juergen Lingnau, Mainz-Laubenheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

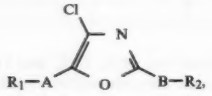
Division of Ser. No. 162,596, Mar. 1, 1988, Pat. No. 4,892,799. This application Oct. 20, 1989, Ser. No. 424,556

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1987, 3706880

Int. Cl.[5] C07D *263/34*

U.S. Cl. 548—235 **4 Claims**

1. A 4-Chlorooxazole represented by formula I



(I)

wherein

A is a single bond or a —CH=CH— group,

B is a single bond when A is the —CH=CH— group, and a —CH=CH— or —CH=CH—CH=CH— group when A is a single bond,

R_1 is phenyl, which is unsubstituted or substituted in one or more positions by (C_1–C_4)-alkoxy or di-(C_1–C_4)-alkylamino radicals, and

R_2 is N-(C_1–C_4-alkyl)-carbazol-3-yl, which is unsubstituted or substituted in one or more positions by (C_1–C_4)-alkyl, (C_1–C_4)-alkoxy, halogen-(C_1–C_4)-alkoxy, hydroxy, halogen, di-(C_1–C_4)-alkylamino or dibenzylamino radicals.

5,025,098

METHOD OF PREPARING BICYCLIC TETRAHYDROXYLATED PYRROLIZIDINES

George W. J. Fleet, Oxford, United Kingdom, assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 404,800, Sep. 8, 1989, Pat. No. 4,992,460. This application Sep. 24, 1990, Ser. No. 586,916

Int. Cl.[5] C07D *487/10*

U.S. Cl. 548—453 **1 Claim**

1. A method for the production of 1α,2α,6α,7α,7aβ-1,2,6,7-tetrahydroxypyrrolizidine comprising:

(a) reacting D-glycero-D-gulo-heptono-1,4-lactone with a silyl blocking agent to protect the primary hydroxyl group and give a protected lactone,

(b) reacting the protected lactone with 2,2-dimethoxypropane to provide a fully protected lactone,

(c) reacting the fully protected lactone with fluoride ion to cleave at C7 and thereby provide access to nitrogen in the ring and give a primary alcohol,

(d) esterifying the primary alcohol with triflic anhydride to afford a triflate,

(e) reacting the triflate with azide ion to give an azidolactone,

(f) reducing the azidolactone to given an azidodiol,

(g) reacting the azidodiol with methanesulfonyl chloride to provide an azidodimesylate,

(h) catalytically hydrogenating the azidodimesylate in ethanol at ambient temperature,

(i) heating the resulting product in ethanol in the presence of sodium acetate to give a tetracyclic pyrrolizidine, and

(j) removing the acetonide protecting groups of the tetracyclic pyrrolizidine by acid hydrolysis to give 1α,2α,6α,7α,-7aβ-1,2,6,7-tetrahydroxypyrrolizidine.

5,025,099

(3-AMINO-1-PROPYNYL)METHYLTHIOTHIOPHENE DERIVATIVES

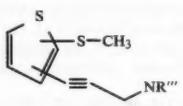
Eugene J. Trybulski, Park Ridge, N.J., and Herbert J. Brabander, Nanuet, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Feb. 2, 1990, Ser. No. 474,574

Int. Cl.[5] C07D *409/06*

U.S. Cl. 548—527 **5 Claims**

1. A compound selected from the formula:



wherein NR''' is pyrrolidino; and the pharmaceutically acceptable acid addition salts thereof.

5,025,100

LIQUID AMINE TERMINATED DERIVATIVES OF DIGLYCIDYL ETHERS

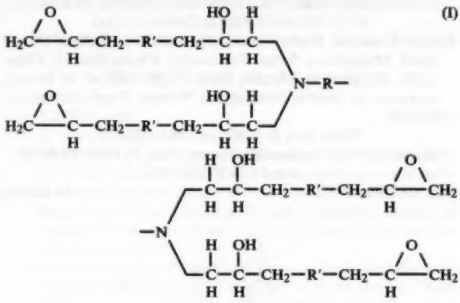
Jiang-Jen Lin, Houston, and George P. Speranza, Austin, both of Tex., assignors to Texaco Chemical Company, White Plains, N.Y.

Filed Feb. 6, 1990, Ser. No. 475,516

Int. Cl.[5] C07D *303/23*

U.S. Cl. 549—551 **4 Claims**

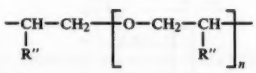
1. An epoxy terminated derivative of a diglycidyl ether having the formula:



(I)

wherein:

R represents a polyoxyalkylene group having the formula:

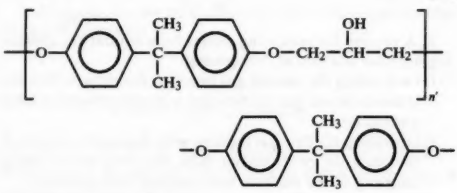


(II)

R″ represents hydrogen, methyl or ethyl,

n is a positive number having a value of about 2 to about 35,

R′ represents a glycidyl ether having the formula:



(III)

wherein n′ represents 0 or a positive number having a value of 1 or 2.

5,025,101

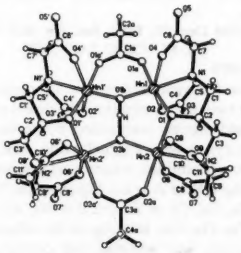
NOVEL TETRANUCLEAR MANGANESE COMPLEXES

Sergiu M. Gorun, Upper Montclair, and Robert T. Stibrany, Long Valley, both of N.J., assignors to Exxon Research & Engineering Company, Florham Park, N.J.

Filed Jun. 21, 1990, Ser. No. 541,699

Int. Cl.[5] C07F *13/00*

U.S. Cl. 556—50 **12 Claims**



1. A composition of matter having the formula:

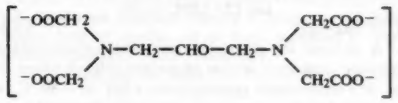
$$M_2[Mn_4(O)(OH)(O_2CR)_2L_2]$$

wherein

M is Mg, Ca, Sr, Ba or mixtures thereof,

R is hydrogen or a hydrocarbyl group; and,

L is a ligand having the formula:



5,025,102

BIS(2-FLUORO-2,2-DINITROETHYL)CARBONATE PENTAFLUOROSULFANYLIMINE

Michael E. Sitzmann, Adelphi, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 18, 1990, Ser. No. 553,835

Int. Cl.[5] C07C *257/06*

U.S. Cl. 558—6 **1 Claim**

1. A compound having the formula $SF_5N{=}C[OCH_2CF(NO_2)_2]_2$.

5,025,103

GLYCEROL AMINOCARBOXYLATES AND PREPARATION AND USE THEREOF

Alfred Oftring, Duerkheim; Stefan Birnbach; Rolf Fikentscher, both of Ludwigshafen; Richard Baur, Mutterstadt; Alexander Kud, Eppelsheim; Ulrich Goeckel, Boehl-Iggelheim, and Johannes Perner, Neustadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

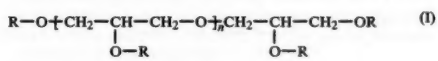
Filed Jan. 19, 1990, Ser. No. 467,204

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1989, 3901613

Int. Cl.[5] C07C *229/26*

U.S. Cl. 560—170 **7 Claims**

1. A glycerol aminocarboxylate of formula

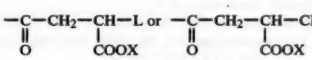


(I)

where

n is from 0 to 10 and

R is



where

L is iminodiacetate, asparate, glutamate, sarcosinate, glycinate, serinate, hydroxyaspartate, ethanolaminoacetate, diethanolamino, alanate or taurinate and

X is hydrogen, an alkali metal, ammonium or substituted ammonium.

5,025,104

2,4-PENTANEDIONE-1-SULFONIC ACID AND METHOD FOR PREPARING THE SAME

Stanley R. Sandler, Springfield, Pa., assignor to Atochem North America, Inc., Philadelphia, Pa.

Filed Sep. 28, 1989, Ser. No. 413,575

Int. Cl.[5] C07C *303/00*; B01J *31/00*

U.S. Cl. 562—109 **2 Claims**

1. 2,4-pentanedione-1-sulfonic acid.

5,025,105

PROCESS FOR PREPARING BROMODIFLUOROACETYLFLUORIDE

Silvana Modena, Monza, and Ezio Strepparola, Treviglio, both of Italy, assignors to AUSIMONT S.r.l., Milan, Italy

Filed Jun. 27, 1990, Ser. No. 544,581
Claims priority, application Italy, Jun. 28, 1989, 21016 A/89
Int. Cl.[5] C07C *51/58*
U.S. Cl. 562—851 9 Claims

1. A process for preparing bromodifluoroacetylfluoride, comprising a gaseous stream of oxygen-diluted ozone is reacted, at a temperature ranging from −100° to +80° C., with 1,4-dibromohexafluorobutene-2, optionally dissolved in a solvent which is inert under the reaction conditions, with consequent obtainment of the corresponding ozonide and, subsequently, the ozonide is subjected to a heat treatment, at temperatures ranging from 100° to 300° C., with consequent obtainment of bromodifluoroacetylfluroide.

5,025,106

PREPARATION OF AQUEOUS SOLUTIONS OF ACETOACETAMIDE

Steven L. Cook, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 22, 1990, Ser. No. 600,648
Int. Cl.[5] C07C *233/05*
U.S. Cl. 564—199 4 Claims

1. Process for the continuous preparation of an aqueous solution of acetoacetamide which comprises the steps of (1) continuously feeding to a reaction zone diketene and aqueous ammonia having an ammonia concentration of about 6.0° to 9.0 weight percent at rates which maintain in the reaction zone a pH of about 7.0° to 8.2 and a residence time of about 20 to 150 minutes while (i) maintaining the temperature of the reaction zone at about 40° to 75° C. and (ii) subjecting the contents of the reaction zone to vigorous agitation and (2) continuously removing from the reaction zone an aqueous product solution having an acetoacetamide concentration of about 25 to 35 weight percent.

5,025,107

PROCESS FOR COPRODUCTION OF ARYLENE DIAMINE DIHALIDES AND ALKYL HALIDES

Kim S. Chamberlin, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 155,171, Feb. 9, 1988, abandoned. This application Jul. 24, 1989, Ser. No. 383,503
Int. Cl.[5] C07C *209/62*
U.S. Cl. 564—414 4 Claims

1. Process for the coproduction of an arylene diamine dihydrohalide and an alkyl halide which comprises the steps of:

(1) reacting an arylene dihalide with an amide or imide at a temperature of at least 160° C. in the presence of an alkali metal base and a copper catalyst to form an arylene bis-amide or arylene bis-imide;

(2) adding dialkyl sulfate to the reaction mixture resulting from step (1);

(3) distilling an alkyl halide from the reaction mixture obtained from step (2); and

(4) adding a hydrohalic acid to the remaining reaction mixture of step (3) and hydrolyzing the arylene bis-amide or arylene bis-imide to the corresponding arylene diamine hydrohalide,

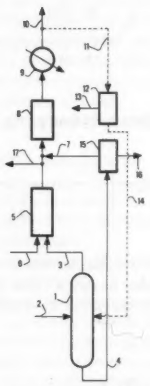
wherein the arylenedihalide is a dibromide or diiodide and the alkyl halide is a bromide or iodide.

5,025,108

PROCESS FOR PRODUCING OLEFINS FROM NATURAL GAS

Charles Cameron, Paris; Hubert Mimoun; Alain Robine, both of Rueil Malmaison; Serge Bonnaudet, Paris; Patrick Chaumette, Bougival, and Quang Dang Vu, Neuilly, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Apr. 4, 1989, Ser. No. 332,831
Claims priority, application France, Apr. 5, 1988, 88 04588
Int. Cl.[5] C07C *2/00*
U.S. Cl. 585—500 15 Claims



1. A process for producing olefins from natural gas containing methane and ethane, comprising:

(a) separating the natural gas into two fractions, a first methane-enriched gas fraction and a second ethane-enriched gas fraction,

(b) oxidizing the first gas fraction with molecular oxygen, in the presence of a contact mass allowing the oxidizing coupling of the methane into superior hydrocarbons,

(c) mixing the effluent from stage (b) with the ethane-enriched gas fraction from stage (a), when at least about 80% by volume of the molecular oxygen has been already consumed in stage (b), and

(d) pyrolizing the mixture resulting from stage (c) to obtain a mixture containing corresponding olefins.

5,025,109

PROCESS FOR UPGRADING METHANE TO HIGHER HYDROCARBONS

Lorenzo C. DeCaul, Chester, Pa.; Scott Han, Lawrenceville, N.J.; Robert E. Palermo, New Hope, and Dennis E. Walsh, Richboro, both of Pa., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Dec. 29, 1989, Ser. No. 459,221
Int. Cl.[5] C07C *2/00, 5/00*
U.S. Cl. 585—500 8 Claims

1. A process for synthesizing one or more hydrocarbons having at least two carbon atoms by the direct partial oxidation of methane, said process comprising contacting a mixture of methane and oxygen with a spinel oxide catalyst under sufficient conversion conditions, wherein said spinel oxide is of the formula AB_2O_4, where A is Li, Mg, Na, Ca, V, Mo, Mn, Fe, Co, Ni, Cu, Zn, Ge, Cd or Sn and B is Na, Al, Ti, V, Cr, Mn, Fe, Co, Ni, Zn, Ga, Ge, Rh, Ag or In, where A and B are different elements, and wherein said conversion conditions include a temperature of from about 300° C. to about 1200° C. and a reactant partial pressure of from about 0.1 atm to about 30 atm.

5,025,110

ALCOHOL REACTION MEDIA FOR PRODUCTION OF HEXABROMOCYCLODODECANE

Phillip R. Beaver, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Feb. 6, 1990, Ser. No. 475,445

Int. Cl.[5] C07C *17/10*

U.S. Cl. 570—206 **19 Claims**

1. A solvent composition comprising

(a) one or more C_5–C_8 saturated linear or branched aliphatic alcohols, wherein each of said one or more alcohols independently has a solubility in water at 25° C. of about five weight percent or less or water has a solubility in each of said one or more alcohols at 25° C. of about fifteen weight percent or less, or

(b) one or more C_5–C_8 saturated linear or branched aliphatic alcohols, wherein each of said one or more alcohols independently has a solubility in water at 25° C. of about five weight percent or less or water has a solubility in each of said one or more alcohols at 25° C. of about fifteen weight percent or less and one or more halogenated hydrocarbons.

5,025,111

PRODUCTION OF NON-CONJUGATED DIOLEFINS

Nicholas J. Hazel, Hull, United Kingdom, assignor to BP Chemicals Limited, London, England

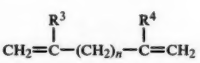
Filed Oct. 17, 1988, Ser. No. 258,477

Claims priority, application United Kingdom, Oct. 21, 1987, 8724628

Int. Cl.[5] C07C *2/76*

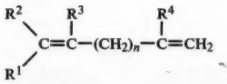
U.S. Cl. 585—601 **12 Claims**

1. A process for the production of a non-conjugated diolefin having the formula:



(I)

wherein R^3 and R^4 are either hydrogen, alkyl or substituted alkyl and n is an interger, which procsss comprises reacting a diolefin having the formula:



(II)

wherein R^3 and R^4 and n are the same as in formula (I) and R^1 and R^2 are either hydrogen, alkyl or substituted alkyl, with ethylene in the presence of a disproportionation catalyst which has been prepared by mixing (a) a disproportionation catalyst comprising rhenium heptoxide supported on a support comprising alumina and (b) a promoter selected from either a tetralkyl tin compound or a trialkyl aluminum compound.

5,025,112

PURIFICATION OF CUMENE RECYCLE STREAMS

John R. Sanderson, Leander; Edward T. Marquis, and John F. Knifton, both of Austin, all of Tex., assignors to Texaco Chemical Company, White Plains, N.Y.

Filed Sep. 10, 1990, Ser. No. 580,035

Int. Cl.[5] C07C *7/00, 7/17*

U.S. Cl. 585—852 **6 Claims**

1. A method for purifying a cumene recycle stream by removing 2-phenyl-2-propanol and cumene hydroperoxide before the cumene is distilled and recycled to the peroxidation reactor which comprises reacting the recycle cumene in the presence of an acid treated montmorillonite clay of the formula:

$$M_{x/n}{}^{n+}{}_{,y}H_2O(Al_{4-x}Mg_x)(Si_8)O_{20}(OH)_4$$

5,025,113

CATALYTIC PREPARATION OF TERTIARY BUTYL ALCOHOL FROM TERTIARY BUTYL HYDROPEROXIDE

John R. Sanderson, Leander, and John F. Knifton, Austin, both of Tex., assignors to Texaco Chemical Company, White Plains, N.Y.

Filed Jan. 29, 1990, Ser. No. 471,450

Int. Cl.[5] C07C *29/132, 31/12*

U.S. Cl. 568—909.8 **6 Claims**

1. In a method wherein a solution of a t-butyl hydroperoxide charge stock in t-butyl alcohol is brought into contact with a catalytically effective amount of a hydroperoxide decomposition catalyst in a hydroperoxide decomposition reaction zone in liquid phase with agitation to convert said t-butyl hydroperoxide to decomposition products, principally t-butyl alcohol, the improvement which comprises:

(a) using, as said hydroperoxide decomposition catalyst, a soluble catalyst system consisting essentially of a soluble iron compound and a soluble ruthenium compound, and

(b) recovering said t-butyl alcohol from the products of said hydroperoxide decomposition reaction,

(c) said soluble iron compound being selected from the group consisting of ferrous and ferric salts of mineral acids and organic carboxylic acids,

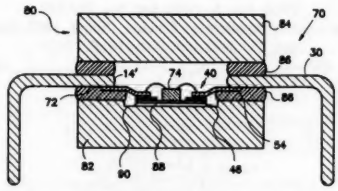
(d) said soluble ruthenium compound being selected from the group consisting of ruthenium salts of mineral acids and organic carboxylic acids.

5,025,114

MULTI-LAYER LEAD FRAMES FOR INTEGRATED CIRCUIT PACKAGES

Jeffrey S. Braden, Milpitas, Calif., assignor to Olin Corporation, New Haven, Conn.

Filed Oct. 30, 1989, Ser. No. 429,120
Int. Cl.[5] H01L *23/02*
U.S. Cl. 174—52.4 32 Claims



1. A composite leadframe, comprising:

a rigid metal portion having a plurality of lead fingers extending in cantilever fashion about a centrally positioned aperture;

a flexible multi-layer portion comprising a plurality of metal foil layers supported and electrically isolated from one another by at least one dielectric layer wherein at least a first metal layer is patterned into a plurality of circuit traces which extend within said centrally positioned aperture, and said circuit traces capable of electrical interconnection to said rigid metal portion, an electronic device or both; and

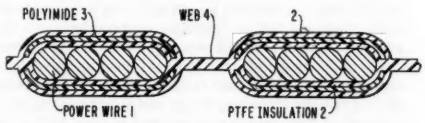
a means for individually electrically interconnecting each of said circuit traces to a lead finger of said rigid metal portion.

5,025,115

INSULATED POWER CABLES

Emile G. Sayegh; James G. Vana, Jr., both of Austin, and Wendall D. Willey, Buda, all of Tex., assignors to W. L. Gore & Associates, Inc., Newark, Del.

Filed May 22, 1990, Ser. No. 526,918
Int. Cl.[5] H01B *7/08*
U.S. Cl. 174—117 F 8 Claims



1. A signal carrying flat ribbon cable having a flat, generally planar power pod as a component thereof, wherein the power pod comprises from inside to outside:

(a) a multiplicity of uninsulated electrically conducting wires arranged in generally parallel planar physical and electrical contact with one another along their axes surrounded by a first layer of polytetrafluororethylene insulation;

(b) a layer on each side of said multiplicity of generally parallel planar wires of a hard cut-through resistant polymer, said cut-through resistant polymer layers being separated from each other along their edges by polytetrafluororethylene insulation; and

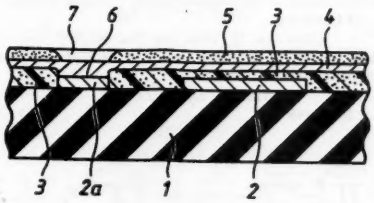
(c) a second layer of polytetrafluoroethylene insulation surrounding said cut-through resistant polymer layers, said wires, and said first layer of polytetrafluororethylene insulation surrounding said wires and including a web, said second layer of polytetrafluoroethylene insulation connecting said power pod to an adjacent component of said ribbon cable by means of the web.

5,025,116

PRINTED WIRING BOARD HAVING ELECTROMAGNETIC WAVE SHIELDING LAYER

Shin Kawakami; Katsutomo Nikaido, and Junichi Ichikawa, all of Saitama, Japan, assignors to Nippon CMK Corp., Japan

Filed Jan. 26, 1990, Ser. No. 470,881
Claims priority, application Japan, Jan. 27, 1989, 18328/89
Int. Cl.[5] H05K *01/00*
U.S. Cl. 174—250 8 Claims



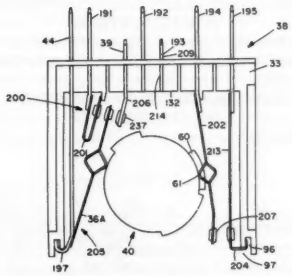
1. A printed wiring board comprising: an insulating sheet; printed wiring circuit and a grounded wiring circuit on one surface of the insulating sheet; an insulating layer on the surface of the insulating sheet, the printed wiring circuit and a portion of the grounded wiring circuit; an electromagnetic wave shielding layer provided on the insulating layer and having a portion in direct contact with uncovered portions of the grounded wiring circuit; and an over-coating layer provided on the electromagnetic wave shielding layer; and wherein portions of the electromagnetic wave shielding layer over the portion in direct contact with the ground wiring circuit are exposed.

5,025,117

CAN OPERATED TIMER WITH IMPROVED HOUSING

Ronald E. Cole, Greenwood, and Daniel K. Amonett, Indianapolis, both of Ind., assignors to Emhart Industries Inc., Towson, Md.

Filed Mar. 29, 1989, Ser. No. 330,158
Int. Cl.[5] H01H *43/00, 9/00*
U.S. Cl. 200—38 R 7 Claims



1. An electromechanical timer comprising:

a housing body having a closed end and an open end, said housing body comprising a u-shaped member having two leg portions and a connecting portion forming said closed end, and said leg portions defining first and second opposed open sides;

a plurality of electrical switches, each switch comprising a pair of contacts, at least one of said contacts comprising a combination electrical terminal and switch blade attached to said housing body and passing through said closed end;

cam means rotatable about an axis for operating said switches;

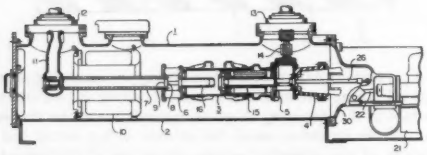
motor means for driving said cam means; and

cam support means for mounting said cam means in said housing body through said open end in a direction radial to said axis of said cam means.

5,025,118
METAL-CLAD, COMPRESSED GAS-BLAST CIRCUIT-BREAKER WITH A SHIFTING LINKAGE

Manfred Meinherz; Freidrich-Wilh Veuhoff; Günther Gilmozzi, and Thomas Kelch, all of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 22, 1990, Ser. No. 467,979
Claims priority, application Fed. Rep. of Germany, Feb. 7, 1989, 3904146
Int. Cl.[5] H01H *33/42*
U.S. Cl. 200—148 R 13 Claims

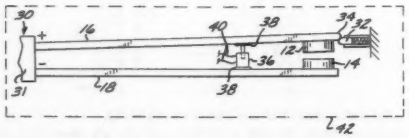


1. A metal-clad, compressed gas-blast circuit-breaker having a gas-filled housing and an interrupter unit, the interrupter unit being supported, insulated in the housing and having contact conduits disposed so that they mutually oppose each other with a clearance and further comprising a movable switching contact for jumpering the contact conduits, and a shifting linkage connected to the switching contact for transmitting a switching motion, wherein the shifting linkage comprises at least one insulating drive rod coupled to the switching contact and a controlling element, for taking up and guiding the flow of switching gases at the time of the switching-off operation, the controlling element being mounted between the interrupter unit and a post insulator penetrated by at least one drive rod, and allowing only one portion of the switching gases to pass through in the direction of at least one drive rod and diverting the remaining portion in an at least radial direction.

5,025,119
ONE-TIME-CLOSE RELAY USEFUL IN SPACECRAFT POWER SYSTEMS

Howard H. Rogers, Torrance, and Jerry J. Herrin, Santa Ana, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Apr. 23, 1990, Ser. No. 513,460
Int. Cl.[5] H01H *1/02*
U.S. Cl. 200—262 8 Claims

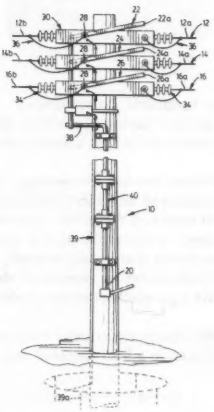


1. A one-time-close relay, comprising:
a first relay contact;
a second relay contact;
means responsive to an electrical control signal for urging said second relay contact into engagement with said first relay contact, to thereby close said relay and form an electrical circuit through said first and second relay contacts; and,
wherein at least respective contact surfaces of said first and second relay contacts are made of conductive materials which form a metallurgical bond upon closing of said relay, whereby said relay is rendered permanently closed and insusceptible of being opened under the influence of electrical energy.

5,025,120
INSERT FOR A HYDRO POLE SWITCH

William E. Jackman, P.O. Box 493, 24 Stewart Drive, Lakefield, Ontario, Canada K0L 2H0

Filed Jan. 6, 1989, Ser. No. 293,937
Claims priority, application Canada, Jan. 8, 1988, 556080
Int. Cl.[5] H01H *33/00;* H01B *17/00*
U.S. Cl. 200—49 6 Claims



1. An insert for a hydro pole switch of the type having a shaft extending the length of a hydro pole and having an upper end and a lower end, a handle joined to said lower end and a switch gear joined to said upper end and responsive to rotation of said shaft to actuate said switch gear, said shaft being formed from a pair of spaced inline shaft rod portions with adjacent end portions separated by a predetermined spacing, said insert comprising:
a rod formed of electrically insulating material having a pair of ends; said rod having a length sufficient to be positioned in line between said end portions; said rod having a radially extending first flange mounted on each end thereof;
a pair of coupling members to join said first flanges with said end portions; each of said coupling members including a second radially extending flange and attachment means to join said coupling member to said end portion; each of said coupling members being arranged to engage said first flanges when said rod is inserted in the space between said second flanges following the attachment of said coupling members to said adjacent end portions.

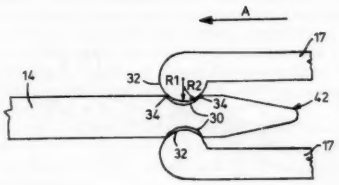
5,025,121
CIRCUIT BREAKER CONTACT ASSEMBLY

Frankie H. Allen, Acworth, and David A. Leone, Lawrenceville, both of Ga., assignors to Siemens Energy & Automation, Inc., Alpharetta, Ga.

Filed Dec. 19, 1988, Ser. No. 286,544
Int. Cl.[5] H01H *1/06*
U.S. Cl. 200—275 6 Claims

1. A primary disconnect assembly for a circuit breaker comprising:
a terminal member defining a first side including a first depression and a second side including a second depression, wherein each depression opens away from the terminal member and each depression includes an arcuate contact surface having a first radius;

at least two contact fingers each defining a contact portion having an arcuate contact surface having a second radius, wherein the second radii are greater than the first radii and the contact portions are adapted to engage the depressions of the terminal member such that at least two contact locations are present between each contact portion and



the terminal member, and the terminal member is situated between the contact portions;

means for holding the contact portions in engagement with the depressions of the terminal member, the contact portions being disposed within the depressions when the assembly is in a normal operating position; and

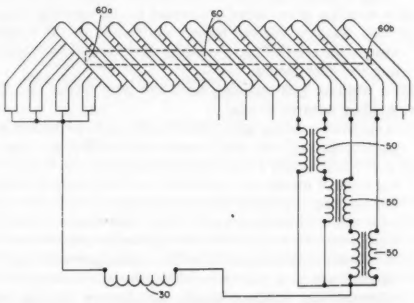
means for coupling the contact fingers to the circuit breaker.

5,025,122

INDUCTION HEATER WITH AXIALLY-ALIGNED COILS

Charles N. Howell, Poland, Ohio, assignor to Ajax Magnethermic Corporation, Warren, Ohio

Filed Nov. 3, 1989, Ser. No. 431,334
Int. Cl.[5] H05B *6/08*
U.S. Cl. 219—10.71 **16 Claims**



1. An electric induction coil assembly for heating associated workpieces of varying lengths which have been inserted therein, the coil assembly having a plurality of selectively energizable lengths, the coil assembly comprising:

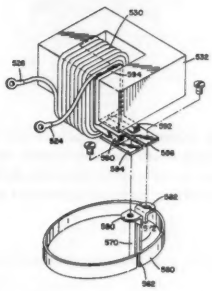
a plurality of axially-aligned induction coils, each coil having a plurality of turns and a pitch length, the coil turns being spaced along the axis of the coil assembly where within an axial distance necessary for a first coil to complete one turn, a portion of at least one other coil is interposed between corresponding points of the first coil, the energized length of the coil assembly being controllable by increments of less than the pitch length of any of the coils.

5,025,123

APPARATUS AND METHOD FOR SEALING A LID ONTO A CONTAINER

George D. Pfaffmann, Farmington Hills, Mich.; Charles S. Kubis, Palso Heights, Ill.; John P. Currie, Boaz, Ala.; Norbert R. Balzer, Warren, Mich.; John Walter, Evergreen Park, Ill., and Graham R. Adams, Boaz, Ala., assignors to Continental Can Company, Inc., Norwalk, Conn.

Continuation of Ser. No. 476,555, Feb. 7, 1990, abandoned, which is a division of Ser. No. 254,837, Oct. 7, 1988, Pat. No. 4,941,306. This application Dec. 24, 1990, Ser. No. 630,802
Int. Cl.[5] H05B *6/10*
U.S. Cl. 219—10.75 **3 Claims**



1. A modular type replaceable heating unit for use in a device for sealing a flat lid with a lower layer of heat bondable material onto an upper, generally flat flange extending around the periphery of an access opening in a container, said sealing device including a plurality of said heating units, means for sequentially moving said modular heating units vertically to and away from said lid, a power supply, a connector for each heating unit electrically connected to said power supply having a first pair of electrical contacts which are stationary relative to said moving means, said modular heating unit comprising: (i) a housing adapted to be mounted to said moving means; (ii) an inductor extending from the lower portion of said housing and adapted to seat against said lid for heat sealing said lid to said flanges; (iii) a matching transformer within said housing, said transformer having a secondary connected to said inductor and a primary; (iv) a pair of bayonet type second contacts extending from said housing and electrically connected to said primary; and (v) cam means extending from said housing for selectively connecting said second contacts with said first contacts upon movement of said housing whereby said transformer and said inductor is energized by said power supply.

5,025,124

ELECTROMAGNETIC DEVICE FOR HEATING METAL ELEMENTS

Lennart A. Alfredeen, 3633 Deer Spring Dr., Bettendorf, Iowa 52722

Filed Jun. 1, 1990, Ser. No. 532,286
Int. Cl.[5] H05B *6/10*
U.S. Cl. 219—10.75 **6 Claims**

1. A device for heating metal comprising a magnetic loop open at two facing ends with an open space therebetween;

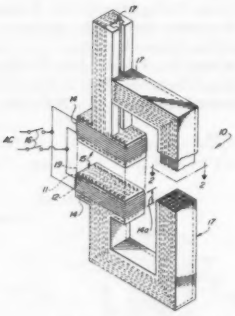
said magnetic loop comprising a plurality of parallel thin plates of high magnetic permeability conductive material;

said platen closely spaced and insulated from each other;

a plurality of core areas, each of said core areas adjacent each of said facing ends and comprising a second plurality of parallel thin plates of high magnetic permeability conductive material having a face at right angles to the plane

of the plates larger in area than the area of the facing end of said loop; and,

a plurality of windings formed of conductive wires, each of



said windings wound around each of said core areas adjacent said facing ends and connected to an alternating current source to reverse the magnetic field in said loop at the frequency of the alternating current source.

5,025,125

BRAZING OR SOLDERING METHOD AND DEVICE INCLUDING A LAMINAR FLOW OR GASEOUS FLUX

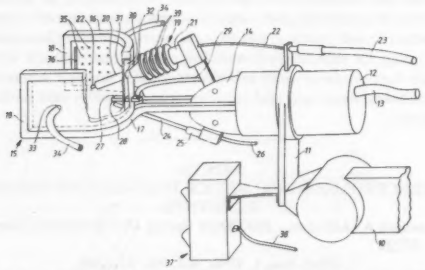
Christer C. I. Peterson, Lidingo, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Oct. 10, 1989, Ser. No. 419,608

Claims priority, application Sweden, Oct. 14, 1988, 8803679

Int. Cl.[5] B23K *1/002*

U.S. Cl. 219—85.11 **9 Claims**



1. A method for joining work pieces by soldering or brazing in which an induction coil is brought to a position to define a soldering and brazing area where the coil at least partly surrounds the work pieces which, by means of induction, are heated to a suitable temperature for the soldering or brazing operation after which a solder is fed to the soldering or brazing area, including the step of blowing a gaseous flux into the soldering or brazing area in a free atmospheric environment before or while the solder is being fed to the soldering or brazing area, wherein the gaseous flux is supplied as a laminar stream of gas.

5,025,126

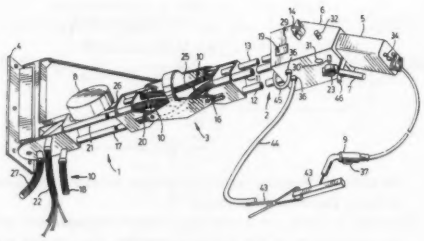
ARTICULATED SUPPORT ARM

Henning Hansen, 1470 Highbush Trail, Pickering, Ontario, Canada L1V 1N5

Filed May 30, 1990, Ser. No. 530,357

Int. Cl.[5] B23K *9/32*

U.S. Cl. 219—125.1 **19 Claims**



1. Manual welding apparatus comprising:

(a) a support arm comprising:

an inner boom having a longitudinal axis;

mounting means, pivotally connected to the inner end of the boom, for pivotally mounting the boom to a stationary supporting structure;

an outer jib having a longitudinal axis;

a knuckle having an inner end pivotally connected to the outer end of the boom and having an outer end pivotally connected to the inner end of the jib; and

support means, connected to the outer end of the jib for supporting a suspended load;

said boom and said jib each constructed of rigid open-ended tube means for providing an at least partially encased access channel between the suspended load and the inner end of the boom;

and said pivotal connections each freely manually pivoting, about single vertical parallel pivoting axes, said inner boom relative to said supporting structure, said knuckle relative to said inner boom independently of the pivoting of said inner boom relative to said supporting structure, and said outer jib relative to said knuckle;

(b) a welding wire feeder connected to the support means;

(c) first welding control means, connected to the support means, for controlling a welding process and for controlling the wire feeder;

(d) a welding gun coacting with the wire feeder and first welding control means;

(e) a spool of welding wire rotatably mounted to the arm and passing through the wire feeder and welding gun; and

(f) a welding supply conductor connected to the first welding control means and associated welding supply source, the welding supply conductor passing through the rigid tube means of the boom and jib and spanning between the rigid tube means of the boom and jib adjacent the knuckle;

whereby welding and control of the welding process may be carried out at a distance from the power supply and whereby the welding supply conductors are partially encased and supported at an elevation within the rigid tube means.

5,025,127

ELECTRONIC WELDING STATION WITH AC AND REVERSIBLE POLARITY DC OUTPUTS

Malcolm T. Gilliland, 310 Pine Valley Rd., Marietta, Ga. 30067

Filed Jun. 30, 1989, Ser. No. 374,465

Int. Cl.[5] B23K *9/10*

U.S. Cl. 219—130.1 **58 Claims**

14. A welding station for selectably providing for positive ground, negative ground, and AC output operation, comprising:

a positive power bus and a negative power bus for receiving input power;

a first output point and a second output point for providing for said positive ground and said negative ground operation;

a third output point and a fourth output point for providing for said AC output operation;

welding parameter selection and drive means for providing a first drive signal and a second drive signal having parameters desired for a selected welding operation;

first switching means having a first terminal and a second terminal and responsive to said first drive signal for conducting current between said first terminal and said second terminal;

second switching means having a first terminal and a second terminal and responsive to said second drive signal for conducting current between said first terminal and said second terminal;

an output transformer having a primary winding for receiving drive power, and a secondary winding for providing an output voltage and an output current to a welding operation, said secondary winding being connected to said third output point and said fourth output point;

third switching means for selectably providing for positive ground operation by connecting said positive power bus to said first output point and connecting said negative power bus to said second output point through a first series circuit comprising said first switching means and a first part of said primary winding, providing for negative ground operation by connecting said negative power bus to said second output point and connecting said positive power bus to said first output point through said first series circuit, and providing for AC output operation by connecting said first series circuit between said positive power bus and said negative power bus, connecting a second series circuit comprising said second switching means and a second part of said winding between said positive power bus and said negative power bus; and

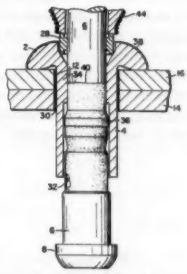
means for connecting a welding torch and a workpiece to a selected pair of said output points for providing an output voltage and an output current to said selected welding operation.

5,025,128

RIVET WITH INTEGRAL HEATER

Rodney L. Derbyshire, Menlo Park, Calif., assignor to Metcal, Inc., Menlo Park, Calif.

Filed Dec. 2, 1988, Ser. No. 278,774
Int. Cl.[5] H05B 6/00
U.S. Cl. 219—200 **17 Claims**



1. A heater system incorporated in a rivet and application tool comprising,

a rivet having a pin and a sleeve that are to extend through a hole to be sealed,

a rivet application tool having a member for gripping said pin,

a ferromagnetic material applied to said rivet adjacent said sleeve,

means associated with said tool to heat said ferromagnetic material to a temperature approaching its Curie temperature, and

a heat activated sealant disposed on said sleeve in a region of the hole in which the pin is to be seated,

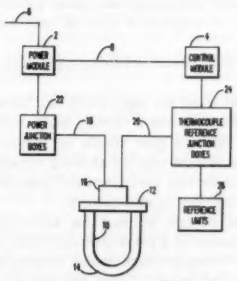
said sealant being activated below said Curie temperature.

5,025,129

REACTOR VESSEL ANNEALING SYSTEM

Phillip E. Miller, Greensburg; Leonoard R. Katz, Pittsburgh; Raymond J. Nath, Murrysville; Ronald M. Blaushild, Export, all of Pa.; Michael D. Tatch, Randolph, N.J.; Frank J. Kordalski, White Oak, Pa.; Donald T. Wykstra, Pittsburgh, Pa., and William M. Kavalkovich, Monroeville, Pa., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Jun. 19, 1989, Ser. No. 368,456
Int. Cl.[5] C21D 9/00
U.S. Cl. 219—201 **27 Claims**



1. A system for annealing a vessel in situ by heating the

vessel to a defined temperature, comprising: electrically operated heater means insertable into the vessel for heating the vessel to the defined temperature; temperature monitoring means positioned relative to said heater means for monitoring the temperature of the vessel; controllable electric power supply means for supplying electric power required by said heater means; control means for controlling the power supplied by said power supply means; a first vehicle containing said power supply means; a second vehicle containing said control means; power conductor means connectable between said power supply means and said heater means for delivering the power supplied by said power supply means to said heater means; signal conductor means connectable between said temperature monitoring means and said control means for delivering temperature indicating signals from said temperature monitoring means to said control means; and control conductor means connectable between said control means and said power supply means for delivering to said power supply means control signals for controlling the level of power supplied by said power supply means to said heater means.

5,025,130

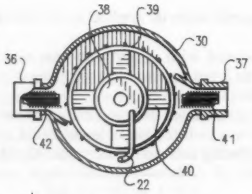
VEHICLE HEATING DEVICE

Michael D. Slone, 5677 Crievewood Dr., Memphis, Tenn. 38135

Filed Dec. 11, 1989, Ser. No. 448,346

Int. Cl.[5] B60L *1/02*

U.S. Cl. 219—203 **5 Claims**



1. A vehicle heating device, comprising:

a housing;

a rechargeable battery in said housing;

a recharging unit in said housing for recharging said battery;

means for selectively connecting said recharging unit to an AC or a DC power supply source;

a blower assembly;

an electric fan in said blower assembly;

at least one electrical resistance heating element in said blower assembly;

a pair of heated air outlet apertures provided on opposite sides of said blower assembly;

a pair of flexible corrugated elongated tubular vent conduits connected to respective ones of said heated air outlet apertures;

each of said vent conduits having a plurality of spaced vent apertures;

a first support stand for supporting said blower assembly in spaced relation above a vehicle dashboard;

second and third support stands for supporting said vent conduits in spaced relation above a vehicle dashboard;

means for connecting said electrical resistance heating element and said fan to said battery;

timing means in said housing for actuating said fan and heating element at a predetermined time; and

a plurality of compartments in said housing dimensioned for removable reception of said blower assembly and said vent conduits.

5,025,131

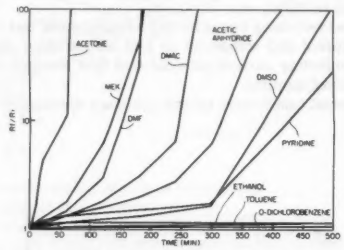
METHOD OF HEATING DIESEL FUEL UTILIZING CONDUCTIVE POLYMER HEATING ELEMENTS

Peter H. van Konynenburg, Palo Alto, and Andrew Au, Fremont, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Division of Ser. No. 423,589, Sep. 27, 1982, Pat. No. 4,935,156, which is a continuation-in-part of Ser. No. 300,709, Sep. 9, 1981, abandoned. This application Jan. 5, 1990, Ser. No. 461,199

Int. Cl.[5] H01G *9/04*

U.S. Cl. 392—451 **14 Claims**



1. A method of heating diesel fuel which comprises passing current through a self-regulating heater which is immersed in the diesel fuel, wherein the heater is a self-regulating heater which comprises

(1) a conductive polymer element composed of a PTC conductive polymer composition comprising a particulate conductive filler dispersed in polyvinylidene fluoride which has a head-to-head content of less than 5%; and

(2) at least two electrodes which are connected to a power source to cause current to pass through the conductive polymer element.

5,025,132

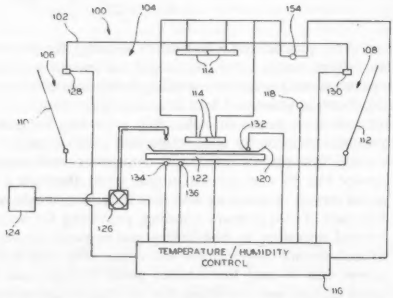
MICROPROCESSOR CONTROLLED FOOD TREATMENT CABINET WITH FLASH STEAMER AND COMPENSATING HUMIDITY CONTROL ROUTINES

Robert C. Fortmann, Mundelein; Curtis C. Pinnow, Libertyville; Gustav Kuschewski, St. Charles, and William A. Joseph, Jr., Elburn, all of Ill., assignors to Carter-Hoffman Corporation, Mundelein, Ill.

Filed May 17, 1990, Ser. No. 524,650

Int. Cl.[5] F27D *7/02*

U.S. Cl. 219—401 **37 Claims**



1. Apparatus for treating and holding food at a predetermined temperature and relative humidity for a finite period of time, comprising in combination:

a cabinet defining an interior storage space for food to be treated, said cabinet having an access opening to permit placement of food items in and removal of food items from

said storage space, said cabinet having a door operatively mounted for selective movement between a closed position, wherein said access opening is covered, and an open position, wherein said access opening is uncovered;

means for sensing if said door is in the open position;

means for heating a heater apparatus, said heater apparatus having a heater surface, said heater surface located within said cabinet, said heater surface capable of being selectively heated to a sufficiently high temperature to effectively vaporize water on said heater surface in said storage space;

means for delivering water against said heater surface in a controlled method to provide water vapor in said storage space;

microprocessor control means coupled to said sensing means and said delivering means and including setpoint means for selecting a desired relative humidity level in said interior storage space for causing said delivering means to deliver a preselected metered volume of water to said heater surface according to said desired relative humidity level and the amount of time that said door has been in the open position to compensate for the loss of humidity from said storage space to the atmosphere upon said door being opened; and

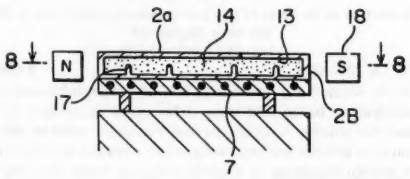
memory means associated with said microprocessor control means, said memory means containing predetermined parameters relating to time and relative humidity characteristics for said storage space, said memory means providing said parameters to said microprocessor control means upon selective querying of said microprocessor control means.

5,025,133

SEMICONDUCTOR WAFER HEATING DEVICE

Kouichirou Tsutahara, and Hiroshi Tanaka, both of Itami City, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jul. 3, 1989, Ser. No. 374,824
Claims priority, application Japan, Apr. 4, 1989, 1-83974
Int. Cl.[5] H05B *3/72*
U.S. Cl. 219—462 **5 Claims**



1. A semiconductor wafer heating device comprising:

a hollow heating stage having opposed first and second surfaces, the first surface for supporting a semiconductor wafer;

an electrically conducting fluid of relatively high thermal conductivity disposed within the hollow heating stage;

a magnet movable relative to said stage for generating a rotating magnetic field within said stage directly coupled to said electrically conductive fluid to stir said fluid; and

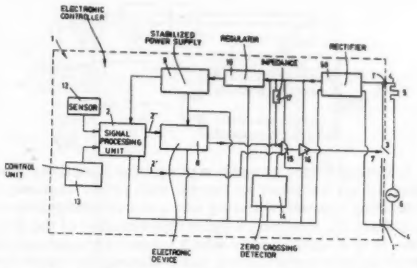
heating means disposed on the second surface of said heating stage for heating the stage.

5,025,134

MEANS FOR REFRESHING A TRIAC CONTROL CIRCUIT POWER SUPPLY

David Bensoussan, 5170 Hingston, Montreal, Canada H3X 3R4 , and Don Tardio, 6631 Paul-Pau, Montreal, Canada H1K 4R7

Continuation-in-part of Ser. No. 355,209, May 22, 1989, abandoned. This application Jan. 16, 1990, Ser. No. 465,734
Claims priority, application Canada, May 24, 1988, 567546
Int. Cl.[5] H05B *1/02*; G05F *1/45*
U.S. Cl. 219—494 **7 Claims**



1. An electronic controller for controlling a supply of an alternating electrical power issued from a first power supply to an electrical load, comprising:

(a) two input terminals between which said first power supply and said load can be connected in series;

(b) an electronic switch connected between said two input terminals;

(c) a second power supply for generating a power supply voltage for said electronic controller, said second power supply voltage being derived from said two input terminals and consequently from said first power supply through said electrical load when said switch is open, said second power supply being provided with means for storing electrical energy;

(d) voltage detecting means having inputs connected to said means for storing electrical energy, and an output for generating a positive output signal when voltage across said means for storing electrical energy is higher than a predetermined voltage value;

(e) a sensor for detecting a measurable physical parameter, and generating a positive output signal when said physical parameter is not within a range of predetermined values;

(f) a zero crossing detector for detecting voltage provided by said first power supply and generating a positive output signal when said voltage of said first power supply crosses zero volt; and

(g) means for generating a command signal to control said supply of electrical power to said electrical load, said means for generating having inputs connected respectively to outputs of said voltage detecting means, said sensor and said zero crossing detector, said command signal having a closing state which causes said electronic switch to close and connect said two input terminals by means of said switch only when said three positive output signals are received at said inputs of said means for generating, in such a manner that said first power supply is connected in series with said load in closed loop and thus supplies said electrical power to said load, said command signal further having a normally open state which causes said electronic switch to open for a whole number of power supply cycles from said first power supply so that said means for storing electrical energy of said second power supply is charged from said first power supply, said command signal being maintained in the open state as long as the three positive output signals are not generated.

5,025,135

CIRCUIT CONFIGURATION FOR THE RECOGNITION OF A PLASMA

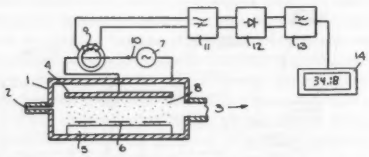
Roland Gesche, Seligenstadt, and Norbert Vey, Mittel-Gründau, both of Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Hanau, Fed. Rep. of Germany

Filed Jun. 9, 1989, Ser. No. 364,812

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1988, 3821208

Int. Cl.[5] B23K *9/00*

U.S. Cl. 219—506 8 Claims



1. Method for the recognition of a plasma comprising: generating a high frequency ac current with preset frequency for generating a plasma; detecting with a circuit configuration the ac current (J); supplying a signal representative of the ac current (J) to a highpass filter which transmits frequencies lying above a preset frequency (fo); and evaluating the output signal of the highpass filter as criterion for the presence or absence of a plasma.

5,025,136

DEVICE FOR AND METHOD OF APPLYING VOLTAGE TO A HEATING RESISTOR IN A MOTOR VEHICLE IN DEPENDENCY ON OPERATING CONDITIONS OF THE VEHICLE

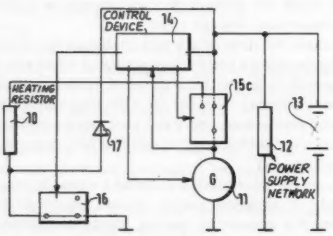
Mathias Doege, Korntal-Muenchingen, and Wunibald Frey, Schwieberdingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 27, 1990, Ser. No. 515,110

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1989, 3919562

Int. Cl.[5] H05B *1/02*

U.S. Cl. 219—508 9 Claims



1. A device for applying voltage to a heating resistor in a motor vehicle having a power generator driven by the vehicle engine and a power supply network connected across terminals of a battery, comprising control means for delivering a heating control signal and signals corresponding to operational conditions of the motor vehicle inclusive of

standstill, running and temperature conditions of the motor vehicle; first switching means responsive to the heating control signal to connect said power generator in parallel to one of said power supply network and one end of said heating resistor when heating is demanded; and second switching means connected to the other end of said heating resistor and being responsive to one of said standstill and running condition signals, said second switching means connecting, when the parallel connection between the power generator and the power supply network is interrupted, said heating resistor parallel to said power generator in response to the standstill condition signal, and connecting said heating resistor in series with said power generator and said power supply network in response to the running condition signal.

5,025,137

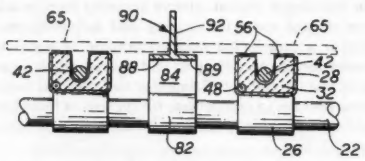
THERMOPLASTIC HEATING APPARATUS

Robert B. Ayrest, 6160 Cobble Stone Rd., Placerville, Calif. 95667

Filed Sep. 18, 1989, Ser. No. 409,606

Int. Cl.[5] H05B *3/42*

U.S. Cl. 219—521 22 Claims



7. An apparatus for heating thermoplastic sheet material, comprising, in combination:

a knockdown frame assembly,

support means coupled to said frame assembly,

a heating rod housed within said support means,

said support means including a trough having a substantially U-shaped cross section along its length and end caps connected to extremities of said trough, said end caps configured as recesses of substantially hemispherical configuration, said heating rod resting in said trough on a plurality of saddles extending up from said trough, whereby said trough and end caps focus heat from said heating rod upwardly.

5,025,138

METHOD AND SYSTEM FOR PROVIDING VERIFIABLE LINE OF CREDIT INFORMATION

Vincent Cuervo, 4251 Aurora St., Coral Gables, Fla. 33146

Continuation-in-part of Ser. No. 739,690, May 31, 1985, Pat. No. 4,718,009, which is a continuation-in-part of Ser. No. 583,591, Feb. 27, 1984, abandoned. This application Jan. 6, 1987, Ser. No. 141,150

The portion of the term of this patent subsequent to Jan. 5, 2006, has been disclaimed.

Int. Cl.[5] G06F *15/30*

U.S. Cl. 235—379 8 Claims

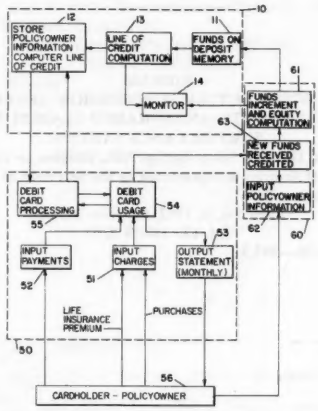
1. A method for providing line of credit information to participating banks that issue debit cards to owners of life insurance policies, wherein the cash surrender value of said life insurance policies has been assigned to a system, selected from the group consisting of a credit clearing house or a lender, which provides credit information to said participating bank, by said policy owner, to secure a line of credit to the owner of the life insurance policies in excess of the debited account, comprising the steps of:

A. providing a system for storing and periodically updating the cash surrender values of the assigned life insurance policies in a computer memory;

B. computing said line of credit for a debit card holder based on said cash surrender values stored for each policy owner;

C. transmitting said line of credit information from said system to participating banks; and

D. monitoring periodically the assigned life insurance policies with said system for any incremental increase of said



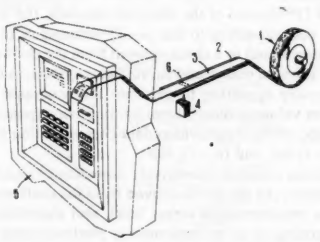
cash surrender values so that the line of credit for the debit card holder may be automatically upgraded.

5,025,139

REDEEMABLE COUPON DISBURSEMENT CONTROL AND REPORTING SYSTEM

W. Ken Halliburton, Jr., 1618 Haynes Dr., Murfreesboro, Tenn. 37130

Filed Dec. 8, 1987, Ser. No. 130,088
Int. Cl.[5] G06F *15/30*
U.S. Cl. 235—379 **27 Claims**



1. A redeemable coupon disbursement control and record system comprising:

(a) An automated teller machine including a user communication means for communication between the automated teller machine user and the automated teller machine, a means for preparing a paper receipt, a means for conveying said receipt paper through said automated teller machine, and a first means for recording information;

(b) Scanning means along the path of conveyance of said receipt paper for reading information recorded on at least one surface of said receipt paper; and

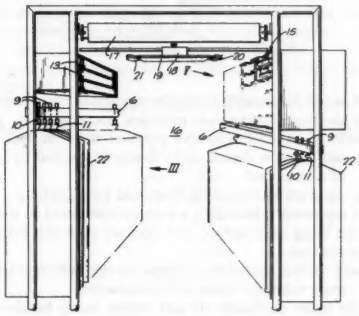
(c) Means for relaying information from said scanning means to said first recording means.

5,025,140

APPARATUS FOR RECEIVING ARTICLES, STORING THEM AFTER PROCESSING AND SUBSEQUENTLY RE-ISSUING THEM

Clement Varley, 110 Gregories Road, Beaconsfield, Buckinghamshire, England

Filed Jul. 5, 1988, Ser. No. 215,035
Claims priority, application United Kingdom, Jul. 2, 1987, 8715543
Int. Cl.[5] G06F *15/24, 7/08*
U.S. Cl. 235—385 **10 Claims**



1. An apparatus for receiving articles to be processed, for storing said articles prior and subsequent to said processing, and subsequently reissuing processed articles to appropriate customers in response to customer supplied information comprising:

a plurality of first article carriers for received articles;

at least one first article carrier storage means for storing at least one of said plurality of first article carriers;

first identification means for uniquely identifying each separate one of said plurality of first article carriers;

a plurality of second article carriers for processed articles;

at least one second article carrier storage means for storing at least one second article carrier;

second identification means for uniquely identifying each separate one of said second article carrier storage means;

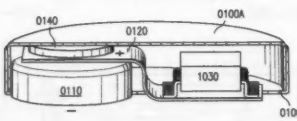
transport means for selectively transporting at least one of said first article carriers from said first article carrier storage means to an article reception location for loading by said customer, and for selectively transporting at least one of said second article carriers from said second article carrier storage means to an article reissue location for retrieval by said customer; and

control means responsive to customer supplied information for selectively activating said transport means for automated handling of said articles, said control means having input means for receiving data corresponding to said first and second identification means and said customer supplied information, said control means further having central processing means for processing received data in accordance with a program stored in memory, said central processing means for creating and storing in memory a first temporary data relationship between said first identification means and said customer supplied information, generally in conjunction with presenting a first article carrier from said first article carrier storage means to said article reception location for loading with an article to be processed by a customer, said central processing means for further creating and storing in memory a second temporary data relationship between said customer supplied information and said second identification means, generally in conjunction with storing a processed article in said second article carrier storage means.

5,025,141
HAND-HELD WAND FOR READING ELECTRONIC TOKENS

Michael L. Bolan, Dallas, Tex., assignor to Dallas Semiconductor Corporation, Dallas, Tex.

Continuation of Ser. No. 352,598, May 15, 1989, Pat. No. 4,945,217. This application Jul. 18, 1990, Ser. No. 554,271
Int. Cl.[5] G06K *7/10*
U.S. Cl. 235—472 **9 Claims**

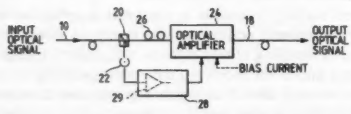


1. A wand for rapidly manually contacting two-terminal thin round electronic token data modules, comprising:
a body of an nonconductive polymer material, including
a base portion shaped to be firmly supported by the hand of a user, and
a top portion extending from said base portion;
said top portion including a surface positioned so that a user can bring said surface into contact with the token to be contacted,
said surface including a recess therein which is shaped to mate with the token to be contacted,
the inner perimeter of said recess being bordered by a conductive ring of conductive material,
said ring of conductive material being connected to a first lead wire;
an additional exposed contact, positioned substantially in the middle of said recess, said additional contact being connected to a second lead wire;
whereby said first and second lead wires can be connected to a host computer to provide a data interface to randomly positioned tokens, as quickly as a user can make contact between said recess and the respective tokens.

5,025,142
LIGHT WAVEFORM CHANGING APPARATUS USING AN OPTICAL AMPLIFIER

Shinichiro Aoshima; Tsuneyuki Urakami, and Yutaka Tsuchiya, all of Shizuoka, Japan, assignors to Hamamatsu Photonics Kabushiki Kaisha, Shizuko, Japan

Filed May 19, 1989, Ser. No. 353,948
Claims priority, application Japan, May 26, 1988, 63-129193
Int. Cl.[5] H01J *40/00*
U.S. Cl. 250—201.9 **23 Claims**

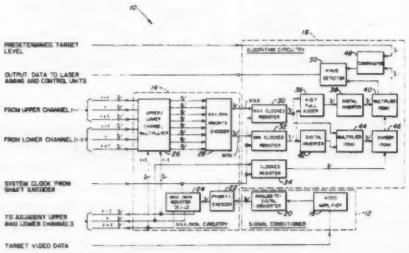


1. A light waveform changing apparatus, comprising:
beam splitting means for branching an input optical signal into a first and second optical signal;
photoelectric converting means for converting said first optical signal into an electrical signal;
an optical amplifier whose gain is adjustable by a controlling optical signal for amplifying said second optical signal;
an input optical path for introducing said second optical signal to said optical amplifier; and
means for converting said electrical signal outputted from said photoelectric converting means into an optical signal and introducing said optical signal into said optical amplifier as said controlling optical signal; wherein
said second optical signal and said controlling optical signal are supplied to said optical amplifier at a predetermined timing of generally coincident arrival.

5,025,143
ENHANCED CLUTTER SUPPRESSION APPARATUS FOR USE WITH AN INFRARED SEARCH AND SURVEILLANCE SYSTEM

Edward S. Dayhoff, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 6, 1982, Ser. No. 395,223
Int. Cl.[5] H04N *5/21*
U.S. Cl. 250—203.3 **5 Claims**


PREDETERMINED TARGET LEVEL
OUTPUT DATA TO LASER AIMING AND CONTROL UNITS
FROM UPPER CHANNEL
FROM LOWER CHANNEL
SYSTEM CLOCK FROM SHAFT ENCODER
TO ADJACENT UPPER AND LOWER CHANNELS
TARGET VIDEO DATA

1. A clutter suppressor/target locator apparatus having (n) identical channels for examining infrared scanning data in the form of target video data (picture elements) from an associated infrared search and surveillance system which includes a shaft encoder, and laser aiming and control units, the (n^{th}) channel of said clutter suppressor/target locator apparatus comprising:
a signal conditioner for amplifying the target video data, which is continuously variable in terms of picture elements, and for converting the target video data, after amplification, into a proportional representation in a digital format:
max/min circuitry operatively connected to said signal conditioner, to the upper channel corresponding to the $(n+1)^{st}$ channel of the identical channels, the lower channel corresponding to the $(n-1)^{st}$ channel of the identical channels, and to a clock derived from the shaft encoder of the infrared search and surveillance system, said max/min circuitry operating to generate the maximum and minimum values in binary form, on two corresponding output buses, of the target video data corresponding to channels (n+1) (n), and (n−1); and
algorithm circuitry operatively connected to said max/min circuitry, to the clock derived from the shaft encoder, and to a predetermined target level, said algorithm circuitry operating so as to implement a predetermined algorithm digitally, the maximum and minimum values in binary form being manipulated according to the predetermined algorithm, which is,

$$T' = \frac{T_0}{\text{Max} - \text{Min} + 1} - \frac{\text{Max} + \text{Min}}{2},$$

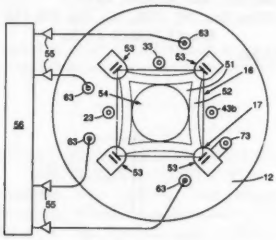
where T_0 is the level of the picture element being tested, max and min are the highest and lowest levels, respectively, of the picture elements surrounding the picture element being tested, and T' is the adjusted target level, said algorithm circuitry operating to output "one" if the adjusted target level is above the predetermined target level.

5,025,144

RESISTIVE ANODE ENCODER TARGET AND METHOD PRODUCING BATHS CHARGED AND VISUAL IMAGES

Robert W. Odom, 446 Jackson Ave., Redwood City, Calif. 94062, and Michael D. Strathman, 5616 S.E. Hawthorne Blvd., Portland, Oreg. 97215

Filed Oct. 6, 1988, Ser. No. 254,442
Int. Cl.[5] H01J *40/14*
U.S. Cl. 250—207 23 Claims



1. An apparatus for imaging incident energetic radiation comprising:

means for detecting said radiation and for producing an amplified and accelerated electron image which corresponds spatially to the incident radiation,

a target disposed in the path of said amplified and accelerated electron image, and

means electrically coupled to said target for producing signals representative of at least one of the two spatial coordinates of the points of impact of the electrons upon said target which comprise said electron image,

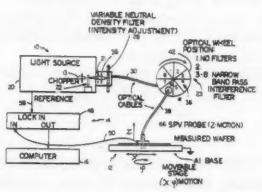
said target being at least partially transparent for producing a visible light output.

5,025,145

METHOD AND APPARATUS FOR DETERMINING THE MINORITY CARRIER DIFFUSION LENGTH FROM LINEAR CONSTANT PHOTON FLUX PHOTOVOLTAGE MEASUREMENTS

Jacek J. Lagowski, 7 Rag Rock Dr., Woburn, Mass. 01801

Filed Aug. 23, 1988, Ser. No. 235,305
Int. Cl.[5] H01J *40/14*
U.S. Cl. 250—211 J 24 Claims



1. A method for determining the minority carrier diffusion length of a sample of a semiconductor material comprising the steps of:

selecting a photon flux for determining said minority carrier diffusion length by illuminating a surface of said semiconductor with beams of radiation having at least two different photon flux values to induce photovoltages, detecting and analyzing said photovoltages as a function of photon flux and; selecting a photon flux based on said analysis;

determining said minority carrier diffusion length by illuminating a surface of said semiconductor successively with beams of monochromatic radiation having different photon energies to induce surface photovoltages;

said radiation at said different photon energies having a photon flux being substantially equal to said selected photon flux;

detecting said photovoltages and;

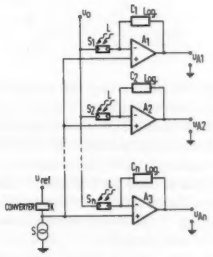
analyzing said photovoltages as a function of the absorption coefficients of said photon energies for said semiconductor to deduce said minority carrier diffusion length.

5,025,146

OPTICAL SENSOR LINE OF AMORPHOUS OR POLYCRYSTALLINE PHOTOELECTRIC MATERIAL HAVING A PLURALITY OF SENSOR ELEMENTS

Peter Kleinschmidt, Munich, and Gerhard Mader, Unterhaching, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jul. 31, 1989, Ser. No. 386,604
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1988, 3833159
Int. Cl.[5] H01J *40/14*
U.S. Cl. 250—214 L 36 Claims



1. An optical sensor line of amorphous or polycrystalline, photo-electric material having a plurality of sensor elements, comprising at least one non-linear element connected to every sensor element as a first converter that converts photo-current (i_{ph}) proportional to the incident quantity of light into a signal voltage (u_s) that is at least approximately proportional to the logarithm of the photo-current (i_{ph}), the sensor element outputting the photo-current (i_{ph}) as a function of the quantity of light incident on the sensor.

5,025,147

SENSOR FOR CONVERTING A DISTANCE TO OPTICAL AND FURTHER TO ELECTRICAL ENERGY, AND SURFACE SCANNING APPARATUS USING SAME

Urs T. Dürig, Rüschlikon, Switzerland; Ulrich C. Fischer, Wetzlar, Fed. Rep. of Germany, and Wolfgang D. Pohl, Adliswil, Switzerland, assignors to Ernst Leitz Wetzlar, GmbH, Wetzlar, Fed. Rep. of Germany and International Business Machines Company, Armonk, N.Y.

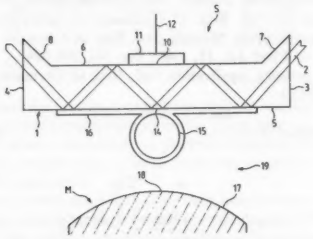
Filed Sep. 22, 1988, Ser. No. 247,706
Claims priority, application European Pat. Off., Sep. 25, 1987, 87114008.3
Int. Cl.[5] H01J *3/14*
U.S. Cl. 250—216 32 Claims

1. An optical sensor for converting a distance value between a sensor and a body to be measured to a quantity of optical energy by using laser light of a predetermined wavelength and for converting said quantity of optical energy to an electrical value representative of said distance value, said sensor including a reference site, said body to be measured including a surface having a measurement site, said distance value being defined between the reference site of the sensor and the measurement site at the surface of the measured body located opposite the sensor and being small enough to be located, at a predetermined wavelength, in an optical near field of the reference site, the sensor comprising:

a sensor body formed as a light waveguide for said laser light and having a light entrance site, a first light exit site for the

light guided through the sensor body and a second light exit site for the light diffracted within the sensor body, said second light exit site being located at a first surface of the sensor body on a side thereof which faces away from the measured body,

a detection particle acting as an antenna and located at a second surface of the sensor body between said light entrance site and said first light exit site and having a substantially convex and rounded off shape and a major dimension which is smaller than said predetermined wavelength, and



a detector means for converting the optical energy of a light portion which leaves the sensor body at the second light exit site into an electrical detector signal,

said sensor body being provided with a continuous thin film formed as a coating so as to substantially cover the detection particle and at least part of said second surface of the sensor body in the vicinity of the detection particle, said thin film having a thickness which is smaller than said predetermined wavelength.

5,025,148

LASER WARNING SENSOR WITH FREQUENCY-CODED POSITION INFORMATION

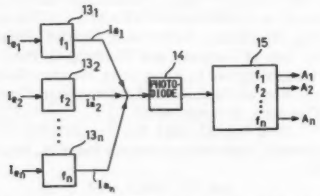
Hans Poisel, Dachau, and Gert Trommer, Munich, both of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Oct. 4, 1989, Ser. No. 416,911

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1988, 3833634

Int. Cl.[5] H01J *5/16*

U.S. Cl. 250—227.12 **7 Claims**



1. A laser warning sensor having a directional resolution capability, comprising a plurality of laser light conductor feedback units (13_1 to 13_n), each feedback unit including an optical input element, an optical output element, and a signal delay glass fiber light conductor having a defined length differing from lengths of other signal delay light conductors of other feedback units, so that each feedback unit is tuned to a fixed separate frequency, each optical input element providing a different azimuth and elevation input information to its feedback unit, each of said plurality of feedback units (13_1 to 13_n) further comprising coupling means for coupling each of said signal delay glass fiber light conductors to its respective feedback unit for forming a signal delay light conductor closed loop (**11**), one end of which is coupled to said optical input element while another closed loop end is coupled to said optical output element, each closed loop producing at said optical output element a separate pulse train based on said separate frequency for identifying said different azimuth and elevation input information to provide said resolution capability.

5,025,149

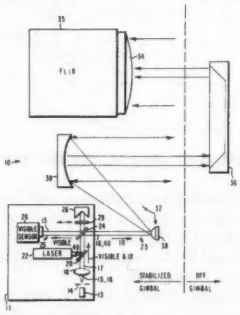
INTEGRATED MULTI-SPECTRAL BORESIGHT TARGET GENERATOR

Dean C. Hatfield, Jr., Los Angeles, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jun. 18, 1990, Ser. No. 539,116

Int. Cl.[5] G01B *11/26*

U.S. Cl. 250—342 **20 Claims**



1. A multi-spectral boresight target generator comprising:

dual band boresight target generator means for simultaneously emitting visible and infrared frequency radiation along a first optical path;

a corner reflector disposed at the distal end of the first optical path that is adapted to retroreflect visible radiation;

a first beamsplitter disposed along the first optical path that is adapted to transmit visible and infrared radiation provided by the dual band boresight target generator means along the first optical path;

a second beamsplitter disposed along the first optical path between the first beamsplitter and the corner reflector that is adapted to reflect infrared radiation from a front surface thereof along a second optical path, transmit visible radiation toward the corner reflector, and reflect the visible radiation retroreflected by the corner reflector from a rear surface thereof along a third optical path;

an infrared sensor disposed along the second optical path that is adapted to image the infrared radiation reflected by the second beamsplitter; and

a visible sensor disposed along the third optical path that is adapted to image the visible radiation.

5,025,150

SITE SURVEY METHOD AND APPARATUS

James G. Oldham, Albuquerque, N. Mex.; Charles R. Spencer, Boise, Id.; Carl L. Begley, and H. Robert Meyer, both of Albuquerque, N. Mex., assignors to MK-Ferguson Company, Cleveland, Ohio and Chem-Nuclear Systems Inc., Columbia, S.C.

Filed Oct. 14, 1988, Ser. No. 257,732

Int. Cl.[5] G01V *5/00*

U.S. Cl. 250—253 **53 Claims**

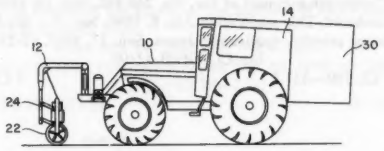
1. A site survey apparatus for detecting a source material present on a site, the apparatus comprising:

a ground vehicle;

means for moving and guiding said ground vehicle on a selected path; and

means for following terrain disposed on said ground vehicle for automatically retaining and independently positioning each of a plurality of detectors above ground, said means

being capable of automatically and independently positioning and retaining each of said detectors at a predetermined height above the ground and in a selected positional



relationship to other detectors and maintaining the positions of said detectors as said vehicle transverses irregular terrain.

5,025,151

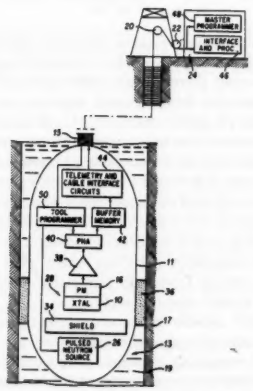
LUTETIUM ORTHOSILICATE SINGLE CRYSTAL SCINTILLATOR DETECTOR

Charles L. Melcher, West Redding, Conn., assignor to Schlumberger Technology Corporation, New York, N.Y.

Division of Ser. No. 389,502, Aug. 4, 1989, which is a continuation-in-part of Ser. No. 254,353, Oct. 6, 1988, abandoned. This application Aug. 30, 1990, Ser. No. 575,187

Int. Cl.[5] G01V *5/10*

U.S. Cl. 250—269 **8 Claims**



1. Apparatus for investigation of subsurface earth formations comprising:

a sonde adapted for movement through a borehole;

detector means carried by said sonde for detecting radiation and including a lutetium oxyorthosilicate scintillator; and

means coupled to said detector means for generating and recording a signal representative of at least one characteristic of radiation detected by said detector means.

5,025,152

APPARATUS FOR SEPARATING ISOTOPES OF URANIUM

Erik H. P. Cordfunke, Schoorl, and Cornelis J. J. Tool, Wognum, both of Netherlands, assignors to Ultra-Centrifuge Nederland N.V., Almelo, Netherlands

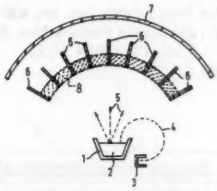
Filed Feb. 7, 1989, Ser. No. 306,899

Claims priority, application Netherlands, Feb. 10, 1988, 8800327

Int. Cl.[5] B01D *59/50, 59/34*

U.S. Cl. 250—281 **6 Claims**

1. An apparatus for separating isotopes of uranium, comprising a vacuum chamber, a source of uranium placed within said chamber, means for evaporating uranium from the uranium source, means for selectively ionizing a selected isotope in the uranium vapor, means for applying an electric and/or a magnetic field in the vacuum chamber, as well as a set of collector plates for collecting the uranium ions and one or more collec-



tor plates for collecting un-ionized uranium atoms, the improvement comprising that the collector plates for the ions consist, at least at the collecting surface, of sintered yttrium oxide made electrically conductive by suitable doping.

5,025,153

SCANNING TUNNELING SPECTROSCOPE AND A SPECTROSCOPIC INFORMATION DETECTION METHOD

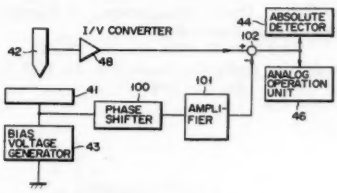
Takao Okada, Hachioji; Akira Yagi, Sagamihara; Seizo Morita, Morioka, and Nobuo Mikoshiba, Sendai, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 6, 1990, Ser. No. 549,469

Claims priority, application Japan, Jul. 11, 1989, 1-177063

Int. Cl.[5] H01J *37/00*

U.S. Cl. 250—306 **20 Claims**



1. A scanning tunnel spectroscope comprising

a probe settable close to a sample;

means for applying a bias voltage (V_T) of a preset waveform varying with time in a constant period between said sample and probe;

means for current-voltage converting a tunnel current flowing when said probe is set close to said sample, to a tunnel current signal (I_T);

means for detecting the absolute value of the tunnel current signal (I_T);

means for servo-controlling a distance between said sample and probe using the absolute value with the servo time constant set larger than five times the period of the bias voltage;

means for obtaining information concerning the unevenness of said sample based on an output of said servo control means; and

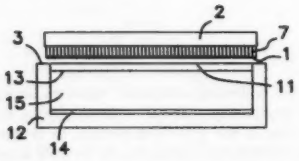
means for effecting the analog operation to derive a differential conductance based on the tunnel current on the real time basis and measuring the unevenness data and differential conductance data on the real time basis with the distance between said sample and probe kept constant.

5,025,154

PROCEDURE AND MEANS FOR MEASURING PAPER FORMATION

Risto Ritala, Helsinki; Mikko Laakso, and Jari Koponen, both of Espoo, Finland, assignors to Kajaani Elektroniikka OY, Kajaani, Finland

Filed Nov. 2, 1989, Ser. No. 430,670
Claims priority, application Finland, Nov. 3, 1988, 885067
Int. Cl.[5] G01N *23/16*
U.S. Cl. 250—308 14 Claims



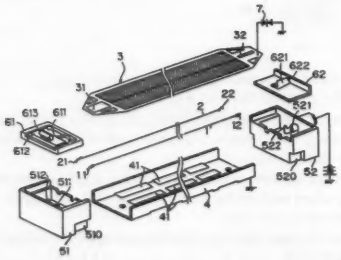
1. A procedure for measuring paper formation, wherein radiation is made to pass through a paper sample and the radiation that has passed through the paper is observed with a β radiation detector, for establishing a spectrum characterizing the formation of the sample, characterized in that for radiation source is used a linear β radiation source and that the β radiation that has passed through the paper is observed in one dimension with a position-sensitive wire chamber detector operating in limited streamer mode.

5,025,155

CHARGING DEVICE FOR ELECTROPHOTOGRAPHIC SYSTEMS

Yoshihiro Hattori, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 10, 1989, Ser. No. 321,312
Claims priority, application Japan, Mar. 11, 1988, 63-58807
Int. Cl.[5] H01T *19/04*
U.S. Cl. 250—326 12 Claims



1. A corona charging device for charging a surface of a moving member, the device comprising:

a plurality of wire electrodes extending in parallel with each other and axially with the moving member;

a high voltage power source for applying a high voltage to the wire electrodes so as to generate corona discharge; and

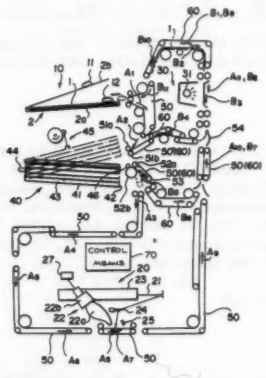
a grid electrode located between the moving member and the wire electrodes, wherein a distance between the grid electrode and the moving member is shortest immediately below the last downstream wire electrode with respect to the moving direction of the moving member.

5,025,156

RADIATION IMAGE READ-OUT APPARATUS

Makoto Ohgoda, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 246,483, Sep. 19, 1988, abandoned. This application Jan. 8, 1990, Ser. No. 462,183
Claims priority, application Japan, Sep. 17, 1987, 62-233423
Int. Cl.[5] G03B *42/00*
U.S. Cl. 250—327.2 7 Claims



1. A radiation image read-out apparatus comprising:

(i) a cassette holding section for releasably holding a cassette which houses therein a stimulable phosphor sheet carrying a radiation image stored thereon, and feeding said stimulable phosphor sheet out of said cassette,

(ii) a read-out section for carrying out radiation image read-out by scanning said stimulable phosphor sheet by a light beam which causes said stimulable phosphor sheet to emit light carrying said radiation image stored on said stimulable phosphor sheet, and detecting the emitted light,

(iii) an erasing section for erasing radiation energy remaining on said stimulable phosphor sheet after the radiation image read-out from said stimulable phosphor sheet is finished at said read-out section,

(iv) a stacker capable of accommodating therein N-number of stimulable phosphor sheets and feeding out said accommodated stimulable phosphor sheets one by one,

(v) a first sheet conveyance means for conveying the stimulable phosphor sheet fed out of said cassette holding section into said stacker, and conveying the stimulable phosphor sheet fed out of said stacker to said read-out section and said erasing section,

(vi) a second sheet a conveyance means for conveying the stimulable phosphor sheet passing through said erasing section into said stacker, and conveying the stimulable phosphor sheet taken out of said stacker into the cassette at said cassette holding section, and

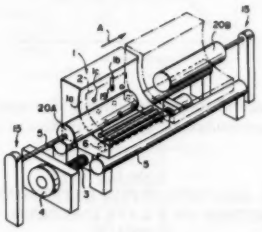
(vii) a control means for controlling the operation of said stacker and said first and second conveyance means so as to preset N−1 number of stimulable phosphor sheets which have been subjected to the erasing step in said stacker at the initial state, and to feed the stimulable phosphor sheet for the first cassette into said read-out section and feed one of the stimulable phosphor sheets out of the stacker into said fist cassette, and to feed the stimulable phosphor sheet form the second and subsequent cassettes into said stacker and feed one of the stimulable phosphor sheets out of the stacker into said second and the subsequent cassettes wherein said cassette holding section, read-out section, erasing section, and stacker are connected to a single reciprocating sheet conveyance path.

5,025,157

LIGHT SCANNING SYSTEM FOR A STIMULABLE SHEET INCLUDING VACUUM AND ROLLER SHEET HOLDING MEANS

Muraishi Katsuaki, Kanagawa, Japan, assignor to Fuji Film Co., Ltd., Kanagawa, Japan

Filed Sep. 14, 1989, Ser. No. 408,014
Claims priority, application Japan, Sep. 14, 1988, 63-230598
Int. Cl.[5] G03B 42/00
U.S. Cl. 250—327.2 3 Claims



1. A light beam scanning system comprising a sheet holding means having a concave cylindrical sheet support surface on which a recording medium sheet is supported,

a sheet conveying means which conveys the recording medium sheet onto the sheet support surface and away from the same,

a suction means which draws the recording medium sheet against the sheet support surface by suction,

a scanning light beam source which emits a scanning light beam,

a spinner having a light deflector mirror which reflects the scanning light beam on the central axis of the cylindrical sheet support surface toward the recording medium sheet on the sheet support surface and a condenser lens system which converges the reflected scanning light beam on the recording medium sheet, the light deflector mirror and the condenser lens system being integrally rotated about the central axis of the cylindrical sheet support surface to cause the scanning light beam to scan the recording medium sheet in a main scanning direction,

a sub-scanning means which moves the sheet holding means in a sub-scanning direction parallel to the central axis relative to the spinner, and

a pair of holding rollers which are spaced from each other in the sub-scanning direction with the spinner intervening therebetween and are opposed to an intermediate portion of the sheet support surface at a distance slightly larger than the thickness of the recording medium sheet so that the recording medium sheet can be inserted between the rollers and the sheet support surface to attendantly prevent the recording medium sheet from lifting away from the sheet support surface beyond said distance, each of the holding rollers being fixedly supported relative to the spinner in the sub-scanning direction and being able to freely rotate about a rotational axis which is parallel to the central axis of the sheet support surface.

5,025,158

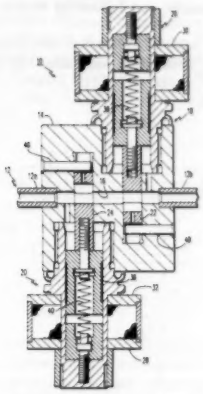
HYDROBALL DETECTOR STRING STEPPING DEVICE

Luciano Veronesi, O'Hara, and Douglas E. Ekeroth, Delmont, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 5, 1990, Ser. No. 461,576
Int. Cl.[5] G21C 17/02
U.S. Cl. 250—328 12 Claims

1. A stepping apparatus for advancing a hydroball detector string having a plurality of spaced apart balls on a cable and being movable in a direction of a counter through a tube under fluid pressure, comprising:

first and second gate means operably coupled to the tube upstream of the counter, for blocking movement of the spring without blocking fluid flow through the tube; and



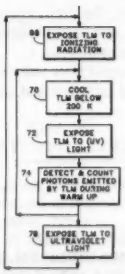
actuator means for moving the first and second gate means in steps into and out of blocking positions in the tube to thereby advance the string one ball at a time to the counter.

5,025,159

METHOD FOR DETECTING RADIATION DOSE UTILIZING THERMOLUMINESCENT MATERIAL

Steven D. Miller, Richland; Joseph C. McDonald, Pasco; Fred N. Eichner, Kennewick, and Paul L. Tomeraasen, Richland, all of Wash., assignors to Battelle Memorial Institute, Richland, Wash.

Continuation-in-part of Ser. No. 213,245, Jun. 29, 1988, Pat. No. 4,954,707. This application Oct. 11, 1989, Ser. No. 420,293
Int. Cl.[5] G01T 1/115
U.S. Cl. 250—337 30 Claims



1. A method for measuring the dosage of ionizing radiation to which a thermoluminescent material has been exposed, comprising the steps of:

(a) cooling the thermoluminescent material down to a temperature substantially below 200 K,

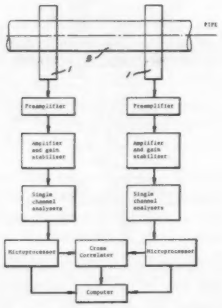
(b) exposing the thermoluminescent material to ultraviolet light in order to photoconvert high temperature traps to low temperature traps, and

(c) detecting light released by the thermoluminescent material as it is allowed to warm.

5,025,160
MEASUREMENT OF FLOW VELOCITY AND MASS FLOWRATE

John S. Watt, New South Wales, Australia, assignor to Commonwealth Scientific and Industrial Research Organisation, Australia

Filed May 31, 1989, Ser. No. 359,377
Claims priority, application Australia, Jun. 3, 1988, 8611
Int. Cl.[5] G01F *1/00*
U.S. Cl. 250—356.1 **22 Claims**



1. A method for measuring liquid flow velocity of a multiphase flow containing at least two liquid phases, said method comprising:

(i) passing said flow through a tube;

(ii) measuring at a first location the intensities of gamma-rays transmitted through a first volume of said flow at two different gamma-ray energies, at least one of said gamma-ray energies having substantially different mass absorption coefficients in each of said two liquids, and obtaining a time varying measurement indicative of the ratio of the mass absorption co-efficients of the first volume at said two energies;

(iii) measuring at a second location spaced from the first location in the direction of said flow the intensities of gamma-rays transmitted through a second volume of said flow at said two different gamma-ray energies and obtaining a time varying measurement indicative of the ratio of the mass absorption co-efficients of said second volume at said two energies;

(iv) cross correlating the time varying measurements obtained at said first and second locations to derive a liquid flow transmit time; and

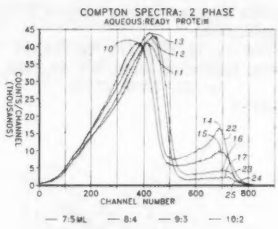
(v) calculating said liquid flow velocity from the transit time and the spacing of said first and second locations.

5,025,161
DETECTING MULTIPLE PHASES IN LIQUID SCINTILLATION SAMPLES

Charles L. Dodson, Orange, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jul. 27, 1989, Ser. No. 386,303
Int. Cl.[5] G01T *1/204*
U.S. Cl. 250—364 **29 Claims**

1. Apparatus for determining the phase content of a liquid scintillation sample comprising means for transforming at least a substantial portion of a Compton spectrum of data into a different geometric space, means for establishing a predetermined parameter in the selected geometric space, the predetermined parameter being indicative of the phase content of the sample, and means for comparing the data in the different

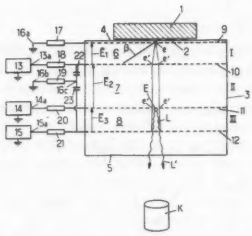


geometric space to the predetermined parameter thereby to provide a determination of the phase content of the sample.

5,025,162
METHOD AND DEVICE FOR DETERMINING THE DISTRIBUTION OF β RAYS EMERGING FROM A SURFACE

Georges Charpak, Paris, France, assignor to Biospace Instruments, Paris, France

Filed Apr. 25, 1990, Ser. No. 514,437
Claims priority, application France, Apr. 27, 1989, 89 05605
Int. Cl.[5] G01T *1/185*
U.S. Cl. 250—385.2 **7 Claims**



1. Method for determining a distribution of β rays emerging from a surface,

which consists in causing these β rays to pass through:

a first substantially proportional preamplification stage formed by a first chamber defined by first and second electrode grids parallel to each other and between which a DC voltage is applied, in which the first electrode grid forms a cathode and said β ray emitting surface is applied thereagainst;

a second transfer stage formed by a second chamber disposed between the second electrode grid which forms an anode and a third electrode grid parallel to the second electrode grid and biased positively with respect thereto; and

a third multiplication stage formed by a third chamber disposed between the third electrode grid and a fourth electrode grid biased anodically by means of a DC voltage relatively to this third electrode grid;

these three chambers being filled with at least one gas;

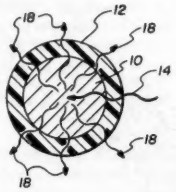
and which is characterized in that

on the one hand, impedance coupling is provided between these four electrode grids, and

on the other hand, said at least one gas is chosen so that in an automatic way due to said impedance coupling the sparks produced by multiplication in the third chamber cannot, under the effect of the return of ions through the transfer stage to the first electrode grid of the first chamber cause a permanent discharge, and in that said sparks are in the

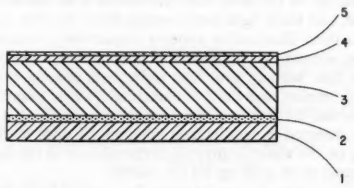
form of brilliant localized points on a surface of the first electrode grid.

5,025,163
RADIOGRAPHIC IMAGING SCREEN
Frederick J. Jeffers, Escondido, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Dec. 1, 1989, Ser. No. 444,507
Int. Cl.[5] G21K *4/00*
U.S. Cl. 250—483.1 **8 Claims**



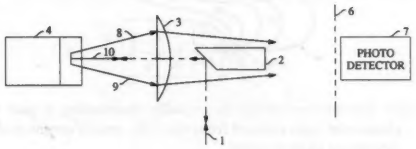
1. A radiographic imaging screen comprising:
a substrate transparent to incident radiation photons;
a composite layer formed on a surface of the substrate including
(a) a substantially uniform distribution of discrete high-Z metal particles adapted to generate secondary electron emissions in any direction from the particle in response to incident high energy radiation photons; and
(b) electron responsive luminescent material completely surrounding and in direct contact with said discrete metal particles in the layer such that secondary electrons emitted from the metal particles encounter the luminescent material regardless of the direction of emission from the particles to thereby enable the generation of visible light photons therefrom.

5,025,164
ANTISTATIC LEAD SCREENS FOR USE WITH X-RAY FILMS
Lloyd G. Sidwell, and Conrad E. Miller, both of Hendersonville, N.C., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Mar. 7, 1990, Ser. No. 490,071
Int. Cl.[5] G03B *42/00*; G03C *5/17*; G21K *4/00*
U.S. Cl. 250—483.1 **4 Claims**



1. A lead absorbing screen for an X-ray photographic element which comprises a flexible, polymeric support; an adhesive layer applied to said support; a flexible layer of lead or lead oxide dispersed in a binder and applied over said adhesive layer; and an overcoat layer applied over said flexible layer; the improvement comprises overcoat layer containing on its surface a sufficient amount of a fluorosurfactant to reduce the propensity of the screen to produce static.

5,025,165
METHOD FOR PRODUCING A SEMICONDUCTOR DEVICE USING AN ELECTRON BEAM EXPOSURE TOOL AND APPARATUS FOR PRODUCING THE DEVICE
Chin-Chin Chen, Scotch Plains, N.J.; Martin Feldman, Baton Rouge, La., and Herbert A. Waggener, Pottersville, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Mar. 26, 1990, Ser. No. 499,153
Int. Cl.[5] H01J *37/20*
U.S. Cl. 250—491.1 **9 Claims**

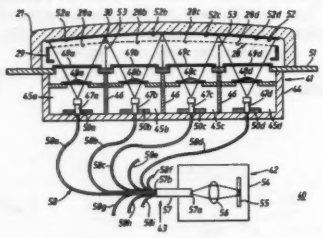


1. Method of producing a semiconductor device comprising:
a) providing a semiconductor body with a processing layer and at least one alignment mark on a major surface of the body;
b) introducing the body into an electron beam exposure tool, associated with the exposure tool being an electron beam reference axis;
c) aligning the body with respect to the electron beam reference axis;
d) exposing, in the exposure tool, a selected portion of the processing layer to an electron beam; and
e) carrying out one or more further steps toward completion of the semiconductor device;
characterized in that
the alignment mark on the body comprises a diffraction grating,
the electron beam exposure tool comprises optical alignment means, step (c) comprises
f) aligning the body relative to a beam of optical radiation associated with the optical alignment means, the beam of optical radiation being a predetermined distance in a predetermined direction from the electron beam reference axis; and further comprises
g) moving the body in the electron beam exposure tool such that the selected portion of the processing layer is aligned to the electron beam reference axis; and
step f) comprises diffracting light from the alignment mark, with the diffracted light comprising $+1,0$, and -1 orders of diffraction; spatially filtering the diffracted light, and detecting the $+1$, -1 diffracted orders of the spatially filtered light.

5,025,166
EXPOSURE APPARATUS FOR COLOR CATHODE RAY TUBES
Yukitaka Miyata, Kanagawa; Hiroyuki Wada, Chiba, and Takashi Nishimura, Saitama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Dec. 29, 1989, Ser. No. 459,429
Claims priority, application Japan, Feb. 1, 1989, 1-023274
Int. Cl.[5] G03B *27/00*
U.S. Cl. 250—492.1 **7 Claims**

1. An exposure apparatus for color cathode ray tubes having a single faceplate with a phosphor screen on an inner surface thereof comprising:
light source means including an initial light source for emitting ultraviolet light;
exposure means including a base for supporting the faceplate with a photosensitive layer formed on the inner surface thereof to form the phosphor screen and having a plurality of sub-regions, a plurality of secondary light sources emit-

ting exposure light for exposing respective sub-regions of the photosensitive layer, and moving means for shifting each position of the secondary light sources at predetermined positions; and



light distribution means for equally distributing a part of ultraviolet light emitted from the light source means to the secondary light sources.

5,025,167

ION IMPLANTATION APPARATUS

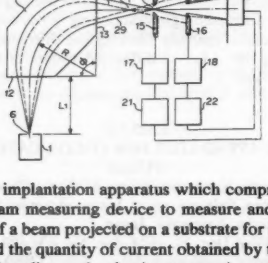
Soichiro Okuda; Tetsuya Nakanishi; Shigeo Sasaki, and Kazuhiko Noguchi, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 6, 1990, Ser. No. 533,769

Claims priority, application Japan, Jun. 6, 1989, 64-144967; Nov. 24, 1989, 64-305122

Int. Cl.[5] H01J *37/317, 37/145*

U.S. Cl. 250—492.2 **6 Claims**



1. An ion implantation apparatus which comprises:

an ion beam measuring device to measure and analyze the shape of a beam projected on a substrate for ion implantation and the quantity of current obtained by the ion beam,

an analyzing slit member having an opening whose width is changeable, which is located in the ion beam track to extract only implantation ions, and

a shaping slit member having an opening whose width is changeable, which is located behind the analyzing slit member to determine the shape of beam to be projected on the substrate for ion implantation, wherein the widths of the openings of the analyzing slit member and the shaping slit member are changed on the basis of the shape of the beam and the quantity of current obtained as a result of the measurement by the ion beam measuring device.

5,025,168

ALIGNMENT APPARATUS INCLUDING THREE BEAMS AND THREE GRATINGS

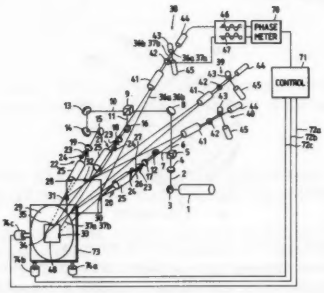
Shinichiro Aoki; Takeo Sato, both of Kawasaki; Katsumasa Yamaguchi, Sagamihara, and Masaki Yamamoto, Tokyo, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 3, 1990, Ser. No. 518,420

Claims priority, application Japan, May 12, 1989, 1-118986

Int. Cl.[5] G01N *21/86;* **G01V** *9/04*

U.S. Cl. 250—548 **10 Claims**



1. An apparatus for aligning a mask and a wafer comprising:

a light source emitting light having two components which have slightly-different frequencies and which have different planes of polarization;

means for separating the light emitted from the light source into first, second, and third light parts travelling along different paths respectively;

first, second, and third reference gratings diffracting the first, second, and third light parts respectively;

first, second, and third illumination optical systems selectively transmitting the diffracted first, second, and third light parts coming from the first, second, and third gratings respectively;

first, second, and third mark gratings formed on the mask and illuminated with the first, second, and third light parts coming from the first, second, and third illumination systems respectively, wherein the first, second, and third mark gratings on the mask diffract the first, second, and third light parts coming from the first, second, and third illumination systems respectively, wherein the first and second mark gratings on the mask are directed in parallel, and wherein the third mark grating on the mask is directed perpendicular to the first and second mark gratings on the mask;

first, second, and third mark gratings formed on the wafer in correspondence with the first, second, and third mark gratings on the mask and illuminated with the first, second, and third light parts coming from the first, second, and third illumination systems respectively, wherein the first, second, and third mark gratings on the wafer diffract the first, second, and third light parts coming from the first, second, and third illumination systems respectively, wherein the first and second mark gratings on the wafer are directed in parallel, and wherein the third mark grating on the wafer is directed perpendicular to the first and second mark gratings on the wafer;

a first detecting device detecting first optical beat signals of the diffracted lights coming from the first mark grating on the mask and the first mark grating on the wafer, the first optical beat signals representing a positional error between the mask and the wafer;

means for comparing phases of the first detected beat signals and generating a first control signal dependent on a difference between the phases of the first beat signals;

a second detecting device detecting second optical beat

signals of the diffracted lights coming from the second mark grating on the mask and the second mark grating on the wafer, the second optical beat signals representing a positional error between the mask and the wafer;

means for comparing phases of the second detected beat signals and generating a second control signal dependent on a difference between the phases of the second beat signals;

a third detecting device detecting third optical beat signals of the diffracted lights coming from the third mark grating on the mask and the third mark grating on the wafer, the third optical beat signals representing a positional error between the mask and the wafer;

means for comparing phases of the third detected beat signals and generating a third control signal dependent on a difference between the phases of the third beat signals; and

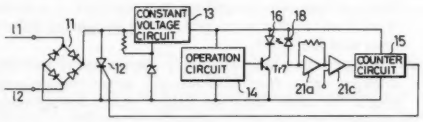
means for adjusting relative positions of the mask and the wafer in accordance with the first, second, and third control signals.

5,025,169

SENSOR IN IC FORMATION

Masao Arakawa; Tomizo Terasawa; Masanobu Ogawa, and Hironori Kami, all of Kadoma, Japan, assignors to Matsushita Electric Works, Ltd., Kadoma, Japan

Filed Oct. 18, 1989, Ser. No. 423,235
Claims priority, application Japan, Oct. 21, 1988, 63-265610
Int. Cl.[5] G01N *15/06*
U.S. Cl. 250—574 **10 Claims**



1. A sensor in an IC formation, which comprises sensor circuit lines connected to a switching means for short-circuiting between the lines and a power source means for taking a power source voltage out of the lines, the power source means being connected at its post stage to an intermittent operating means, light emitting means and driving means for said light emitting means, the intermittent operating means being arranged to intermittently actuate the light emitting means, a light receiving means disposed for receiving a faint pulsed light generated by scattering of light emitted from said light emitting means, a comparing means of signals received as amplified from said light receiving means together with a reference signal, and a counter means for providing a trigger signal to said switching means in response to an output signal from said comparison means, wherein constituent elements of respective said means are in said IC formation and formed as integrated circuits on a dielectric isolation substrate.

5,025,170

UNDERWATER MAGNETIC SWITCH FOR ELECTRICAL CABLE TRANSMITTING A.C. ELECTRICAL CURRENT

Owen W. Sutton, San Diego, Calif., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 30, 1990, Ser. No. 516,964
Int. Cl.[5] H01H *36/00*
U.S. Cl. 307—116 **4 Claims**

1. An underwater magnetic switch for electrical cable transmitting A.C. electrical current comprising:

a predetermined length of underwater electrical cable having a front end and a rear end;

at least three primary electrical conductors passing longitudinally through said cable from its front end to its rear end;

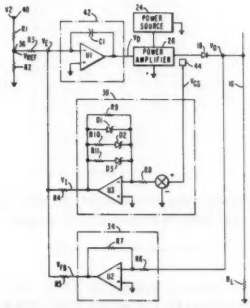
the first of said primary electrical conductors having a magnetic reed switch in the circuit intermediate its ends, said magnetic reed switch having first and second connection terminals;

the second of said primary electrical conductors being a current carrying conductor;

the third of said primary electrical conductors being a ground wire;

a triac having a source of electrical current input connection terminal, a load connection terminal and a trigger terminal;

the trigger terminal of said triac being electrically connected to the first connection terminal of said magnetic reed switch, the input terminal of said triac being connected to said first primary electrical conductor, the load connection terminal of said triac being connected to said first primary electrical conductor;



said second connection terminal of said magnetic reed switch being electrically connected to said first primary electrical conductor prior to the conductors connection to the input terminal of said triac;

said magnetic reed switch, said triac and a predetermined portion of said three primary electrical conductors being surrounded by an elongated tubular waterproof casing and said casing is filled with a hardened epoxy resin; and

a tubular collar, having a magnet mounted thereon, surround said tubular casing and it is mounted thereon so that it can be reciprocally moved to respective positions for opening and closing said magnetic reed switch.

5,025,171

METHOD AND ARRANGEMENT FOR PROVIDING POWER OPERATION OF SWITCHGEAR APPARATUS

Thomas O. Fanta, Melrose Park, and Leonard V. Chabala, Maywood, both of Ill., assignors to S&C Electric Company, Chicago, Ill.

Filed Sep. 22, 1989, Ser. No. 411,274
Int. Cl.[5] H02B *1/04*
U.S. Cl. 307—150 **14 Claims**

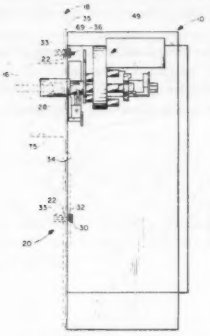
1. A kit of component parts capable of being assembled with either an existing, installed switchgear arrangement or during manufacture of the switchgear arrangement to provide power operation of the switchgear, the switchgear including energizable input connections, an enclosure having predetermined components, one or more switches, each of the switches having a respective switch-operating shaft that extends through the enclosure, the switch-operating shaft being rotatable to operate a respective switch, the kit comprising:

first switch-operator means including a switch-operator enclosure, rechargeable power supply means, and drive output means defining a drive output for coupling to the switch-operating shaft;

means for attaching said first switch-operator means to the switchgear enclosure in a predetermined configuration about the switch-operating shaft;

power-deriving means adapted to be attached to a predeter-

mined component of the switchgear apparatus and including an input for connection to energized portions of the switchgear for providing at a predetermined output power that is derived from the energized switchgear; and



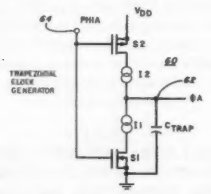
means for connecting the output of said power-deriving means to said first switch-operator means.

5,025,172

CLOCK GENERATOR GENERATING TRAPEZOIDAL WAVEFORM

Kenneth J. Carroll, San Jose, and Benjamin D. Pless, Menlo Park, both of Calif., assignors to Ventritex, Inc., Sunnyvale, Calif.

Division of Ser. No. 354,632, May 19, 1989. This application Feb. 8, 1990, Ser. No. 476,932
Int. Cl.[5] H03K *5/00, 5/13*
U.S. Cl. 307—261 **6 Claims**



1. A clock generator for generating a trapezoidal clock waveform comprising:

first MOS switch means having a first end and a second end;

first current source means having a first end connected to the first end of said first switch means and a second means connected to an output node;

second MOS switch means having a first end and a second end;

second current source means having a first end connected to the first end of said second switch means and a second end connected to the output node;

the second end of said second MOS switch means being connected to an upper supply potential and the second end of said first MOS switch means being connected to a lower supply potential;

said first and second MOS switch means being responsive to a periodic control signal for turning on and off same; and

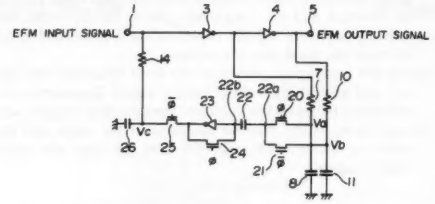
capacitor means coupled between the output node and the lower supply potential and being responsive to said first and second MOS switch means for producing a trapezoidal clock waveform.

5,025,173

EFM-SIGNAL COMPARATOR

Takashi Ubayama; Eiichi Suzuki, and Morito Morishima, all of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

Filed Sep. 7, 1989, Ser. No. 403,826
Claims priority, application Japan, Sep. 8, 1988, 63-225454
Int. Cl.[5] H03K *5/04*
U.S. Cl. 307—265 **5 Claims**



1. An EFM-signal comparator which superposes a direct voltage on an input EFM signal, and produces a square wave of a predetermined duty cycle by comparing the superposed signal of the direct voltage and the input EFM signal with a predetermined threshold voltage, said EFM-signal comparator comprising:

primary direct-voltage-output means which produces a direct voltage corresponding to a duration of a first level of said square wave;

secondary direct-voltage-output means which produces a direct voltage corresponding to a duration of a second level of said square wave, said second level being different from said first level;

switching means which selectively outputs one of said direct voltages either from said primary direct-voltage-output means or from said secondary direct-voltage-output means;

voltage-output means which outputs a voltage corresponding to the direct voltage outputted from said switching means; and

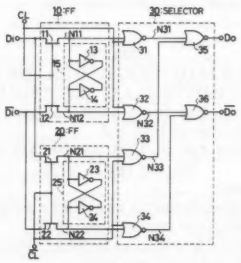
smoothing means which smoothes and superposes said voltage outputted from said voltage-output means on said input EFM signal.

5,025,174

FLIP-FLOP CIRCUIT

Makoto Shikata, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Feb. 21, 1989, Ser. No. 313,077
Claims priority, application Japan, Feb. 29, 1988, 63-47047
Int. Cl.[5] H03K *3/289, 3/26, 3/29*
U.S. Cl. 307—272.2 **19 Claims**



1. A flip-flop circuit comprising:

first and second flip-flops each having respective first and second output nodes;

said first flip-flop being coupled for latching input data and inverted input data in synchronization with a clock signal

and an inverted clock signal and for generating a first output signal and a first inverted output signal at said first output node and said second output node of said first flip-flop;

said second flip-flop being coupled for latching input data and inverted input data in synchronization with said inverted clock signal and clock signal and generating a second output signal and a second inverted output signal at said first output node and said second output node of said second flip-flop; and

a selector circuit coupled to said first and second flip-flops for selecting and outputting said first output signal and first inverted output signal responsive to said clock signal and selecting and outputting said second output signal and second inverted output signal responsive to said inverted clock signal;

wherein said first flip-flop comprises first and second transfer gates coupled for receiving said input data and inverted input data, respectively, responsive to said clock siganl, and first and second inverters cross-coupled across the output node of said first and second transfer gates, said output nodes of said first and second transfer gates comprising said first and second output nodes of said first flip-flop; and

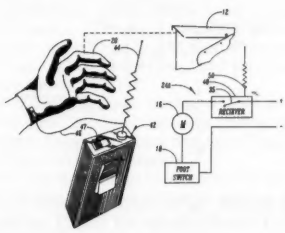
wherein said second flip-flop comprises third and fourth transfer gates coupled for receiving said data and inverted input data, respectively, responsive to said inverted clock signal, and third and fourth inverters cross-coupled across the output nodes of said third and fourth transfer gates, said output nodes of said first and second transfer gates comprising said first and second output nodes of said second flip-flop.

5,025,175

SAFETY MEANS FOR POWERED MACHINERY

Gerald N. Dubois, III, Pleasant Hill, Iowa, assignor to Townsend Engineering Company, Des Moines, Iowa

Filed Oct. 10, 1989, Ser. No. 419,124
Int. Cl.[5] F16P *3/00;* **B26D** *7/22;* **A22C** *17/12;* **A22B** *5/16*
U.S. Cl. 307—326 **4 Claims**



1. A safety means for powered machinery, comprising,

a safety glove adapted for wearing by a machine operator, said glove having an electroconducting surface,

an electrically powered machine having a grounded frame, an electrical motor, and a control switch, said electrical motor being connected to a source of electrical energy through said control switch,

a control safety circuit connecting said glove and said motor, and bypassing said control switch, and including a circuit breaking means, whereby said circuit breaking means will open and deprive said motor from electrical power whenever the electroconducting surface of said glove comes into contact with said grounded frame,

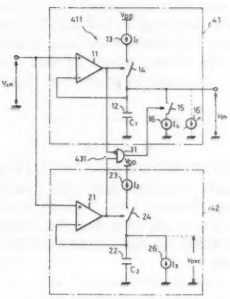
said electroconductive surface of said glove being the antenna of a radio transmitter worn by said operator, and said circuit breaking means including a radio receiver means, whereby said circuit breaking means will remain closed when receiving a radio signal, but will open when said antenna is connected to said grounded frame through contact between said grounded frame and said electroconducting surface of said safety glove to interrupt the transmission of a radio signal from said radio transmitter to said radio receiver means, whereupon the supply of electrical power to said electrical motor will cease.

5,025,176

PEAK LEVEL DETECTION CIRCUIT

Minoru Takeno, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jan. 30, 1990, Ser. No. 472,151
Claims priority, application Japan, Jan. 31, 1989, 1-21318
Int. Cl.[5] H03K *5/153*
U.S. Cl. 307—351 **11 Claims**



1. A peak level detection circuit comprising:

a first means for successively holding peak levels of pulses of input pulse trains by charging or discharging a capacitor in accordance with the peak levels of the pulses of the input pulse trains and for outputting the peak levels held as detection results of the peak level detection circuit;

a second means for detecting the peak levels of pulses of said input pulse trains and for generating a pulse detecting signal which indicates if the pulses exist or not; and

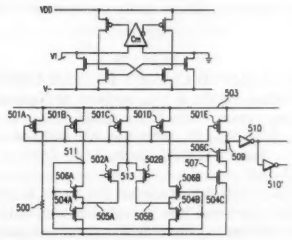
a third means for monitoring said pulse detection signals from said second means and for controlling said capacitor of said first means such that each time an input pulse train appears, a last peak level charged in the capacitor is reduced.

5,025,177

SENSITIVE LOW POWER COMPARATOR

Robert W. Mounger, Dallas, Tex., assignor to Dallas Semiconductor Corporation, Dallas, Tex.

Filed Jul. 28, 1989, Ser. No. 387,471
Int. Cl.[5] H03K *5/24*
U.S. Cl. 307—355 **6 Claims**



1. A MOS circuit, comprising:

P-channel first and second transistors, respective gates of said first and second transistors being connected to respective ones of a differential pair of input signals;

first, second, and third current sources,

current from said first current source being sinked through an N-channel third and fourth transistors connected in series,

current from said third current source being sinked

through an N-channel fifth and sixth transistors connected in series,

the sources of both said first and second transistors being commonly connected to jointly sink current from said second current source, the drain of said first transistor being connected to a node between said fourth and third transistors, and the drain of said second transistor being connected to a node between said sixth and fifth transistors, so that input signals can steer current from said second current source into either said third transistor or said fifth transistor;

the drain of said fourth transistor being commonly connected to provide a gate voltage to said third, fourth, and sixth transistors,

said fourth and sixth transistors having substantially identical widths and lengths, and said third and fifth transistors having substantially identical widths and lengths;

and wherein the drain voltage of said sixth transistor is commonly connected to proivde an analog output voltage.

5,025,178

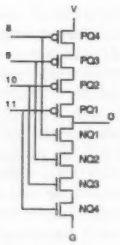
FAULT-RESISTANT SOLID-STATE LINE DRIVER

Patrick O. Nunally, Diamond Bar, Calif., assignor to General Dynamics Corp., Pomona Div., Pomona, Calif.

Filed Oct. 18, 1988, Ser. No. 259,386

Int. Cl.[5] H03K *19/007, 17/687, 19/094, 17/60*

U.S. Cl. 307—442 **5 Claims**



1. An improved, fault-resistant line driver comprising:

a pair of P-type transistors connected in series between a bus output and a voltage source;

a pair of N-type transistors connected in series between the bus output and a connection to ground;

a first input line connecting both the gate of the P-type transistor closest to the voltage source and the gate of the N-type transistor closest to the bus output; and

a second input line connecting both the gate of the P-type transistor closest to the bus output and the gate of the N-type transistor closest to the connection to the ground.

5,025,179

ECL CLAMPED CUTOFF DRIVER CIRCUIT

Oscar W. Freitas, Portland, Me., assignor to National Semiconductor Corporation, Santa Clara, Calif.

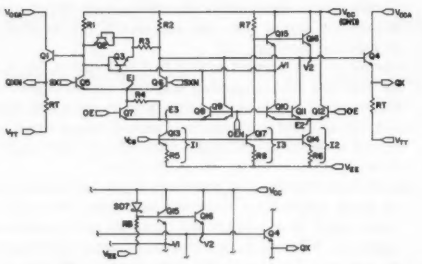
Filed Sep. 15, 1989, Ser. No. 407,544

Int. Cl.[5] H03K *19/86, 5/12, 3/01*

U.S. Cl. 307—455 **26 Claims**

1. An ECL cutoff driver circuit for an ECL gate coupled between ECL high and low potential power rails, said ECL gate having differential input first and second gate transistor elements with differential signal inputs, said ECL gate having at least one output node (V1, V2) at a collector node of one of the first and second gate transistor elements, said output node being coupled to an ECL output (QXN, QX) by an output buffer transistor circuit for delivering ECL output signals of high and low potential levels V_{OH} and V_{OL} at the ECL output during operation of the ECL gate in a switching mode, said ECL cutoff driver circuit being operatively coupled to said output node for shifting down the ECL output to a cutoff potential level having a maximum upper value V_{OLZ} in a cutoff state, said ECL cutoff driver circuit comprising:

cutoff clamp circuit means comprising voltage drop components operatively coupled in series between the ECL high



potential power rail and said output node (V1, V2) for clamping the ECL output (QXN, QX) at a voltage level having a minimum lower value substantially at said cutoff voltage level V_{OLZ} in the cutoff state for the fast return of the ECL gate to operation in the switching mode.

5,025,180

TTL TO ECL VOLTAGE LEVEL TRANSLATOR

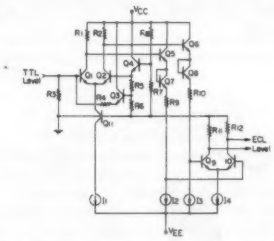
Heung S. Kim, Inchon, and Chan K. Myung, Seoul, both of Rep. of Korea, assignors to SamSung Semiconductor and Telecommunication Co. Ltd., Gumi, Rep. of Korea

Filed Jul. 5, 1988, Ser. No. 215,294

Claims priority, application Rep. of Korea, Jul. 7, 1987, 87-7260

Int. Cl.[5] H03K *19/092, 19/086*

U.S. Cl. 307—475 **7 Claims**



1. A TTL to ECL signal translator circuit for interfacing between a TTL transfer-circuit and an ECL receive-circuit to translate a transfer-circuit signal, which varies between a first TTL input voltage level and a second TTL input voltage level, into an ECL level signal, which varies between a first ECL output voltage level and a second ECL output voltage level, which is compatible with said ECL receive-circuit, the circuit comprising:

reference voltage means for providing a reference voltage at a level between said first TTL input voltage level and said second TTL voltage level;

comparator means for comparing said reference voltage to said transfer-circuit signal and for generating a comparison signal which corresponds to said comparison;

voltage level shift means for converting said comparison signal into a level shifted signal varying between a first voltage level and a second voltage level wherein said level shifted signal is in phase with said transfer-circuit signal; and

active pull down means, operatively coupled to said refer-

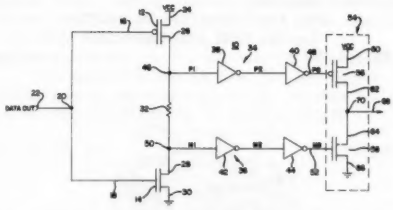
ence voltage means, for selectively injecting current into said transfer-circuit when the transfer-circuit signal voltage level is the lower of said first TTL input voltage level or said second TTL input voltage level.

5,025,181

APPARATUS FOR GENERATING DIGITAL GATING SIGNALS IN RESPONSE TO A DIGITAL DATA SIGNAL

Charles Farmer, Austin, Tex., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Aug. 31, 1990, Ser. No. 576,060
Int. Cl.[5] H03K *19/094*
U.S. Cl. 307—571 **4 Claims**



1. An apparatus for generating a pair of digital gating signals in response to a digital data signal, the apparatus comprising:

a first and a second digital switching means for switching digital signals;

a resistive means for establishing resistance in a circuit path; and

first and second threshold means for generating digital signals when receiving an input signal which exceeds a preestablished threshold value;

said first and second digital switching means commonly receiving said data signal at their respective gates;

said first digital switching means being operatively connected between a voltage source and said resistive means and generating a first gating signal of said pair of gating signals intermediate said first digital switching means and said resistive means;

said second digital switching means being operatively connected between said resistive means and ground and generating a second gating signal of said pair of gating signals intermediate said resistive means and said second digital switching means;

said first threshold means having a first preestablished threshold value receiving said first gating signal as said input signal, and generating a first digital signal representative of said first gating signal;

said second threshold means having a second preestablished threshold value, receiving said second gating signal as said input signal, and generating a second digital signal representative of said second gating signal;

said first digital switching means being configured as a pull-up digital switch, said second switching means being configured as a pull-down digital switch, and said first preestablished threshold value being lower than said second preestablished threshold value.

5,025,182

DIGITAL APPARATUS FOR GENERATING GATING SIGNALS IN RESPONSE TO A DATA SIGNAL

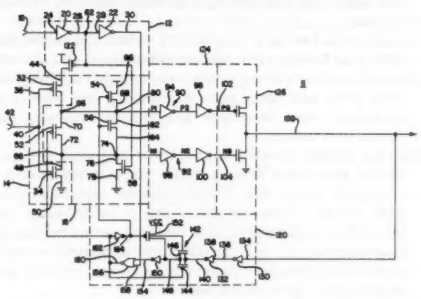
Charles Farmer, Austin, Tex., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Aug. 31, 1990, Ser. No. 576,610
Int. Cl.[5] H03K *19/094*
U.S. Cl. 307—571 **4 Claims**

1. A digital apparatus for generating digital gating signals in response to a data signal, said digital gating signals comprising a first gating signal and a second gating signal, said first gating signal and said second gating signal being selectively isolatable from each other according to a state signal; the apparatus comprising:

a gate signal means for receiving said data signal and generating said first and second gating signals, said first gating signal being presented on a first line, said second gating signal being presented on a second line;

a state input means for receiving said state signal and distributing a plurality of control signals to the apparatus, each of said plurality of control signals being representative of said state signal; and



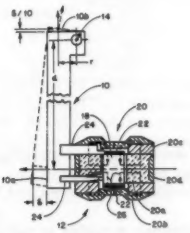
an override means for imposing values on said first line and said second line, said imposing being effected in response to said control signals, said override means electrically isolating said first line and said second line in response to said control signals.

5,025,183

ELECTROMAGNETIC ACTUATOR DRIVER APPARATUS WITH PIVOT AXIS

Anthony N. Fuschetto, W. Redding, Conn., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 17, 1989, Ser. No. 353,121
Int. Cl.[5] H02K *41/02*; B23Q *1/00*; G02B *26/00*
U.S. Cl. 310—20 **5 Claims**



1. A slidable electromagnetic actuator driver apparatus comprising in combination:

a drive arm having an input end and an output end, said drive arm operatively connected to a pivot axis for rotation thereabout, said drive arm having a predetermined length, said pivot axis being spaced a predetermined distance from the centerline of said drive arm, and

means for electrromagnetically driving said drive arm from a rest position to a displaced position, said electromagnetic drive means being responsive to a control signal to slidably displace said drive arm a predetermined amount, said electromagnetic drive means comprises an electrically actuated bobbin unit including a predetermined number of bobbin fingers extending in opposite directions away from the central portion of said bobbin unit, said central portion of said bobbin unit including means for receiving said

control signal, and a magnetic flux generating means operatively engaged with said bobbin unit, said magnetic flux generating means generating a magnetic flux which operatively engages said central portion of said bobbin unit, said bobbin unit in response to said control signal and said magnetic flux operating to displace said drive arm, said magnetic flux generating means comprises:

an inner pole, said inner pole comprising a magnetic material, said inner pole having a substantially solid cylinder structure,

an outer pole having a substantially cylindrical shape, said outer pole having a first and second member, said first and second members being operatively engaged to form said outer pole, said outer pole surrounding said inner pole completely, said outer pole substantially enclosing said bobbin unit therein,

first and second permanent magnet means, said first and second permanent magnet means respectively having a cylindrical shape, said first and second permanent magnetic means operatively positioned respectively in said first and second member, said first and second permanent magnet means operatively positioned to respectively surround said inner pole, said outer pole surrounding said permanent magnet means, and

first and second bias end magnets operatively aligned with said inner pole inside the outer end of said permanent magnet means.

5,025,184

SMALL-SIZED ELECTRIC MOTOR

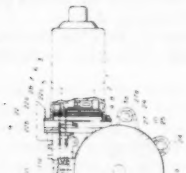
Shuji Sekine, and Naoto Harada, both of Yokohama, Japan, assignors to Jidoshi Denki Kogyo K.K., Kanagawa, Japan

Filed Mar. 13, 1990, Ser. No. 493,047

Claims priority, application Japan, Mar. 14, 1989, 1-28885[U]

Int. Cl.[5] H02K *11/00, 7/10, 5/10*

U.S. Cl. 310—71 **1 Claim**



1. A small-sized electric motor comprising:

a gear case having an end bracket;

a holder base provided with a brush and fitted to said end bracket;

a pair of plate terminals provided to said holder base, connected with said brush at the base ends thereof and protruding through the end bracket in the opposite direction of the holder base at the tip ends thereof;

a sealing member fitted on the tip ends of said plate terminals;

a terminal container part formed in one body with the gear case contiguously to said end bracket for housing the tip ends of said plate terminals; and a container cover for covering said terminal container part;

said terminal container part being provided with a container-side projection having a tapered face inclined to the end bracket side;

said container cover being provided with a cover-side projection having a tapered face forming a lower pair with the tapered face of the container-side projection provided to said terminal container part and a sealing member-pressing face on the reverse side of said tapered face of the cover-side projection; and

said sealing member being pressed toward the end bracket with the sealing member-pressing face of the cover-side projection provided to the container cover by a lower pair of said both tapered faces at the state of connecting lead wires for power supply to the tip ends of said plate terminals and covering the terminal container part with said container cover.

5,025,185

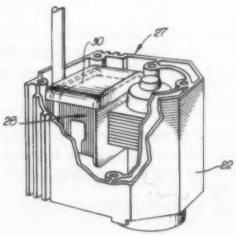
BUBBLE TRAP FOR EPOXY SEALANT IN A SUBMERSIBLE ELECTRIC MOTOR

Robert F. Reinoehl, Simi Valley, Calif., assignor to Aquaria, Inc., Simi Valley, Calif.

Filed Jun. 7, 1988, Ser. No. 203,731

Int. Cl.[5] F04D *1/00;* **H02K** *5/04*

U.S. Cl. 310—87 **11 Claims**



1. A bubble trap for electric motors that include a motor housing with a cavity, a stator assembly received within the cavity, and a sealant material filling the cavity space between the stator assembly and the motor housing, thereby preventing moisture from reaching the coils of the stator assembly, wherein:

the bubble trap comprises a non-porous generally planar raised dome that fits in the cavity, is located substantially within the sealant material, and extends laterally across the cavity over the cross-sectional area of the stator assembly.

5,025,186

ULTRASONIC MOTOR

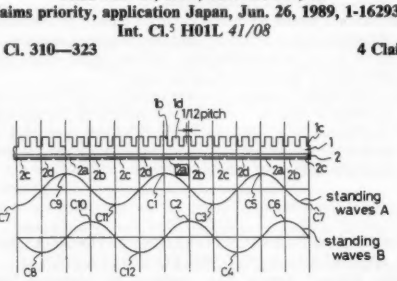
Nobuo Tsukada, Tokyo, Japan, assignor to Seiko Instruments Inc., Japan

Filed Jun. 15, 1990, Ser. No. 539,723

Claims priority, application Japan, Jun. 26, 1989, 1-162938

Int. Cl.[5] H01L *41/08*

U.S. Cl. 310—323 **4 Claims**



1. An ultrasonic motor utilizing travelling wave generated in a vibrator for rotating a movable member comprising:

a vibrator provided on one surface thereof with a piezoelectric element;

comb-like projections arranged alternately in the circumferential direction thereof on the other surface of said vibrator;

a movable member provided on said vibrator;

a pressure-regulator provided on said movable member for generating suitable contact pressure between said movable member and said vibrator; and

fan-shaped electrode patterns provided on one surface of said piezoelectric element, the number of which is a multiple of 4, arranged at regular intervals in the circumferential direction thereof, wherein the number of said fan-shaped electrode patterns and that of said comb-like projections of said vibrator have no common divisor with respect to each other.

5,025,187

ACTUATOR AND CONTROL SYSTEM FOR CLEANING OF MIRROR-LIKE OBJECTS

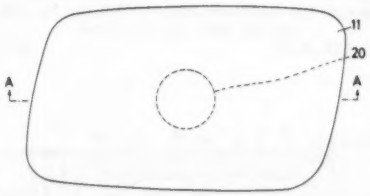
Naofumi Fujie, Nagoya; Tomoaki Imaizumi, Hoi; Koji Ito, Kariya, and Shoji Okada, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Continuation of Ser. No. 357,960, May 30, 1989, abandoned. This application Aug. 23, 1990, Ser. No. 576,165

Claims priority, application Japan, May 30, 1988, 63-132205; May 31, 1988, 63-134920; Jul. 21, 1988, 63-182659

Int. Cl.[5] H01L *41/08*

U.S. Cl. 310—323 **14 Claims**



1. A self-cleaning plate unit comprising a generally planar plate member, and vibrating means mounted on said plate member for producing in said plate member a standing wave substantially parallel to the plane of said plate member at a uniform frequency substantially equal to the corresponding resonant frequency of the plate unit, in order to remove foreign substances from said plate member, said vibrating means contacting said plate member over an area substantially smaller than the area of said plate member.

5,025,188

ELONGATE TUBULAR INCANDESCENT LAMP WITH FILAMENT SHORTING BARS

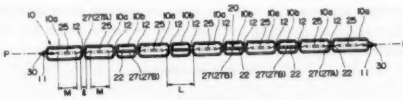
Toru Odagaki, Okayama, Japan, assignor to Ushio Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 2, 1990, Ser. No. 487,389

Claims priority, application Japan, Mar. 17, 1989, 1-29735[U]

Int. Cl.[5] H01K *1/02, 1/24*

U.S. Cl. 313—273 **1 Claim**



1. In a tube type incandescent lamp having light-emitting parts and non-light-emitting parts, wherein a filament assembly comprises coiled filaments and short bars, which are arranged alternately, the short bars are separately held by corresponding constricted portions provided in a tube envelope made of glass, and each of light-emitting parts and the non-light-emitting parts is formed of a space portion surrounded by a part of the tube envelope between adjacent constricted portions, the improvement wherein the outermost ones of the short bars in the filament assembly are shorter than the other short bars and two light-emitting parts are continuously formed at each outer portion of the incandescent lamp.

5,025,189

DYNAMIC FOCUSING ELECTRON GUN

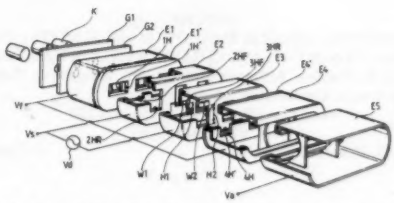
Wan-jae Son, Cheonan, Rep. of Korea, assignor to Samsung Electron Devices Co., Ltd., Rep. of Korea

Filed Nov. 3, 1989, Ser. No. 431,250

Claims priority, application Rep. of Korea, Nov. 5, 1988, 88-14575

Int. Cl.[5] H01J *29/50*

U.S. Cl. 313—414 **4 Claims**



1. A dynamic focusing electron gun for producing a plurality of electron beams comprising a triode including a plurality of cathodes, a control grid, and a screen grid, and a main lens means including a plurality of electrodes for forming a dynamic quadrupole focusing lens for focusing the electron beams, said main lens means comprising a first focusing electrode disposed proximate said screen grid, a second focusing electrode disposed proximate a final acceleration anode, a static potential electrode disposed proximate said first focusing electrode, and a dynamic potential electrode, said static potential electrode and dynamic potential electrode being disposed between said first and second focusing electrodes and forming the dynamic quadrupole lens wherein said static potential electrode includes vertically elongate electron beam passing exit holes for passage of the electron beams out of said static potential electrode toward said dynamic potential electrode and said dynamic potential electrode includes laterally elongate electron beam passing entrance holes for passage of the electron beams into said dynamic potential electrode from said static potential electrode.

5,025,190

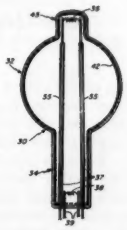
GLOW DISCHARGE LAMP

Andre C. Bouchard, Peabody; Paul A. Thibault, Danvers; Lagushenko Radomir, Brookline; Jakob Maya, Brookline, and Jakob Maya, Brookline, all of Mass., assignors to GTE Products Corporation, Danvers, Mass.

Filed Dec. 30, 1987, Ser. No. 139,396

Int. Cl.[5] H01J *61/64*

U.S. Cl. 313—619 **18 Claims**



1. A glow discharge lamp comprising;

a light transmitting envelope containing a noble gas fill material and having a maximum cross-section bulbous

region, a neck region, and a dome region at the top thereof outside said bulbous region,

a pair of electrodes disposed in said envelope,

and lead-in wires coupled to the electrodes and extending through and hermetically sealed in said envelope,

said electrodes being disposed in oppositely spaced positions in the envelope, one of said electrodes being disposed in said dome region, the other of said electrodes being positioned outside of said bulbous region at said neck region of the envelope such that a substantial portion of the evaporants originating from said other of said electrodes is confined to said neck region to thereby retard the formation of deposits at said bulbous region.

5,025,191

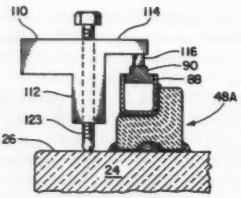
ADJUSTABLE-HEIGHT SHADOW MASK SUPPORT FOR A FLAT TENSION MASK COLOR CATHODE RAY TUBE

James R. Fendley, Arlington Heights, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Dec. 21, 1989, Ser. No. 454,223

Int. Cl.[5] H01J *29/07*

U.S. Cl. 313—407 **25 Claims**



1. A tension mask color cathode ray tube including a glass faceplate having on its inner surface a centrally disposed, rectangular screen having on opposed sides thereof a shadow mask support structure including Q-height adjustment means for receiving and securing said mask, said Q-height adjustment means providing for Q-height adjustment prior to the securing of said mask.

5,025,192

END BASE CONSTRUCTION FOR A DISCHARGE LAMP

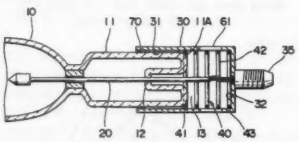
Manabu Okamoto, Kakogawa, Japan, assignor to Ushio Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 6, 1989, Ser. No. 375,873

Claims priority, application Japan, Jul. 26, 1988, 63-97989[U]

Int. Cl.[5] H01J *61/36*

U.S. Cl. 313—623 **2 Claims**



1. In a discharge lamp comprising a light-emitting tubing, which is equipped with an envelope having a bulged portion defining a discharge space and side tube portions extending from both sides of the bulged portion and having a graded seal structure constructed by joining a plurality of glass members, each having progressively higher thermal coefficients of expansion in an order proceeding from said bulged portion, and has electrode rods hermetically extending through the respective side tube portions into the bulged portion; and cylindrical bases fitted on the respective side tube portions in such a manner that the bases cover respectively the outer end portions of the side tube portions with a gap between the outer peripheral surface of each side to portion and the base and fixed with a cement filling said gap on the respective side tube portions so as to define radiating spaces in which the outer surfaces of the ends of the side tube portions are respectively positioned, the improvement wherein cement-controlling members for avoiding the outflow of the cement from said gap into the radiating space are respectively provided in the bases, each of the cement-controlling members comprising a first ring portion received in an annular recess defined by the outer periphery of the end wall of the side tube portion and the inner peripheral surface of the base so as to be held in contact with both outer periphery of the end wall of the side tube portion and inner peripheral surface of the base, a second ring portion held in contact with the inner bottom surface of the base and a connecting portion adapted to connect the first ring portion and the second ring portion.

5,025,193

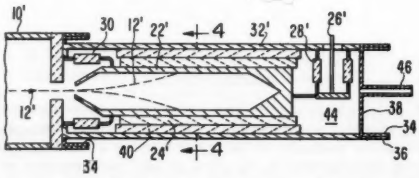
BEAM COLLECTOR WITH LOW ELECTRICAL LEAKAGE

Bertram G. James, Redwood City, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 244,546, Sep. 15, 1988, abandoned, which is a continuation of Ser. No. 7,232, Jan. 27, 1987, abandoned. This application Jun. 19, 1990, Ser. No. 540,409

Int. Cl.[5] H01J *23/027, 23/033*

U.S. Cl. 315—5.38 **36 Claims**



1. A collector assembly for an electron tube having a vacuum envelope and outer casing comprising:

a conductive hollow collector electrode within said outer casing and spaced therefrom so as to define an annular space radially therebetween;

a first insulative support means at the entrance of said collector supporting said electrode within said casing and isolating said annular space from the vacuum envelope, said annular space being adaptable to confining a special environment differing from that of said vacuum envelope;

a first axially continuous dielectric zone surrounding and in contact with said collector within said isolated annular space;

a second axially continuous dielectric zone surrounding said collector and in contact with said casing and said first dielectric zone;

said zones defining one or more dielectric elements of circular cross-section throughout said entire annular space within said special environment, enhancing thermal transfer while minimizing current flow between collector and outer casing.

5,025,194

VAPOR AND ION SOURCE

Jacques Menet, Saint-Egreve, and Olivier de Gabrielli, Grenoble, both of France, assignors to Centre National de la Recherche Scientifique, Paris, France

Filed Nov. 30, 1988, Ser. No. 442,798

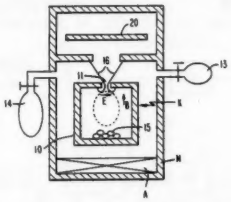
Claims priority, application France, Nov. 30, 1988, 88 16012

Int. Cl.[5] H01J *27/02*

U.S. Cl. 315—111.81 **7 Claims**

1. In a low pressure chamber, a vapor and ion source comprising:

an anode;
an equipotential cavity cathode structure, said cathode structure including a front plate facing said anode, said front plate provided with an aperture;
means for introducing a gas into said chamber;
means for removing gas from said chamber;



ionizable material contained within said cathode cavity;
means for applying a magnetic field perpendicular to said front plate within said cathode cavity; and
means for generating an electrical field orthogonal to said magnetic field with said cathode cavity, whereby ion discharge is initiated within said cathode cavity.

5,025,195

CURRENT MONITORING

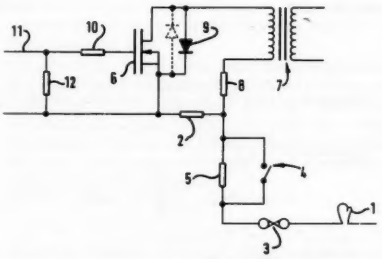
Malcolm R. Reeves, Chippenham, Great Britain, assignor to Westinghouse Brake and Signal Holdings Limited, Wiltshire, England

Filed Dec. 1, 1989, Ser. No. 444,289

Claims priority, application United Kingdom, Feb. 8, 1989, 8902793

Int. Cl.[5] G08B *21/00*

U.S. Cl. 315—136 **12 Claims**



1. A circuit arrangement including a load, resistive means through which at least part of the current through the load flows and detection means for providing a signal dependent on the value of the said current, the detection means comprising a circuit branch connected across the resistive means and including a field-effect transistor (FET), a transformer having a primary winding which is connected to the FET and an input connected with the gate of the FET for receiving a voltage for use in turning on the FET, the circuit arrangement being such that, if the FET is turned on, the circuit branch provides said signal as an output voltage across said secondary winding of said transformer, said output voltage being substantially proportional to the value of the said current.

5,025,196

IMAGE FORMING DEVICE WITH BEAM CURRENT CONTROL

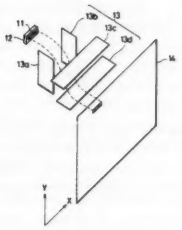
Hidetoshi Suzuki, Atsugi; Ichiro Nomura; Toshiaki Majima, both of Tokyo, and Mitsuru Yamamoto, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 55,935, Jun. 1, 1987, abandoned. This application Jun. 26, 1990, Ser. No. 545,115

Claims priority, application Japan, Jun. 2, 1986, 61-125917; Jun. 16, 1986, 61-138226; Jul. 31, 1986, 61-178664

Int. Cl.[5] H05B *41/00*

U.S. Cl. 315—168 **17 Claims**



1. An image forming device comprising:
a cold cathode member, comprising a semiconductor, for generating an electron beam;
an accelerating electrode member for withdrawing the electron beam generated by said cathode member;
a member for modulating the electron beam;
a member for deflecting the electron beam;
an image forming member for forming an image by irradiation by the electron beam,
wherein the accelerating electrode member is integrally molded together with said cold cathode member on a side of said image forming member relative to said cold cathode member through an electrical isolator;
a detecting means for detecting a current flowing to said accelerating electrode member, which current is caused by a part of the electron beam generated by said cold cathode member; and
a control means for outputting a control signal in proportion to the current detected,
wherein variation with time of quantity of the electrons emitted per unit time from said cold cathode member to said image forming member is hindered by supplying the control signal from said control means to a power source of said cold cathode member or of said accelerating electrode member.

5,025,197

CIRCUIT ARRANGEMENT FOR A.C. OPERATION OF HIGH-PRESSURE GAS DISCHARGE LAMPS

Hans G. Ganser, Stolberg; Ralf Schäfer, Aachen, and Hans P. Stormberg, Stolberg, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 5, 1985, Ser. No. 708,316

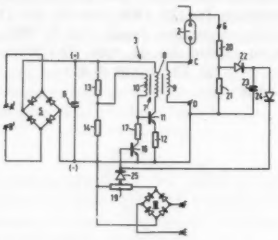
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1984, 3408426

Int. Cl.[5] H05B *37/02*

U.S. Cl. 315—172 **21 Claims**

1. A circuit arrangement for A.C. operation of high-pressure gas discharge lamps comprising: a ballast current limiter coupled between the lamp and a mains alternating voltage source, a high-frequency oscillator supplied with direct current and producing a high-frequency current through the lamp superimposed on the mains alternating lamp current, said oscillator comprising a high-frequency transformer, a first transistor connected in series with a primary of the transformer, the first transistor being periodically switched on and switched off, means connecting a first secondary of the transformer in series

with the lamp, the ratio between switching-on time and switching-off time (duty cycle) of the first transistor being so small that the effective value of the high-frequency current coupled into the lamp during stable lamp operation lies between 0.05



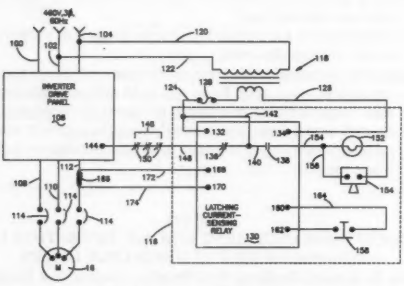
and 5% of the mains alternating lamp current, and an auxiliary device connected to provide a low resistance shunt across the base-emitter path of the first transistor outside the proximity of the zero passages of the mains alternating lamp current.

5,025,198

TORQUE COUPLING SYSTEM FOR GRAPHITE IMPELLER SHAFTS

George S. Mordue, Ravenna, and Herbert L. Ritchie, Jr., North Ridgevill, both of Ohio, assignors to The Carborundum Company, Niagara Falls, N.Y.

Division of Ser. No. 315,533, Feb. 24, 1989. This application Apr. 9, 1990, Ser. No. 506,676
Int. Cl.[5] H02H *7/085*
U.S. Cl. 318—434 **6 Claims**



1. A torque coupling system for molten metal pumps, mixers, or dispersers, comprising:

a graphite shaft having an impeller at one end;

an electric motor connected to the other end of the graphite shaft, the electric motor adapted to rotate the graphite shaft and the impeller;

power supply means for supplying electrical current to the motor;

a current sensor electrically connected to the power supply means for sensing whenever current being drawn by the motor exceeds a predetermined limit; and

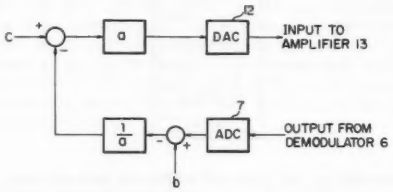
disabling means connected to the power supply means for disabling the power supply means, the disabling means being electrically connected to the current sensor and being activated upon receiving an electrical signal therefrom.

5,025,199

SERVO CONTROL APPARATUS

Hidenobu Ako, Ogaki, Japan, assignor to Teijin Seiki Company Limited, Osaka, Japan

Filed Aug. 14, 1989, Ser. No. 392,892
Claims priority, application Japan, Aug. 23, 1988, 63-209757
Int. Cl.[5] G05B *13/00*
U.S. Cl. 318—561 **8 Claims**



1. A servo control apparatus comprising:

means for generating a required position value;

an actuator adapted to drive a load and having its maximum displacements in one direction and its minimum displacement in the other direction;

drive means for driving said actuator;

position detecting means for detecting a displacement of said actuator; and

control means for correcting said required position value on basis of said maximum and minimum displacements of said actuator and for computing a deviation between an output of said position detecting means and said corrected required position value;

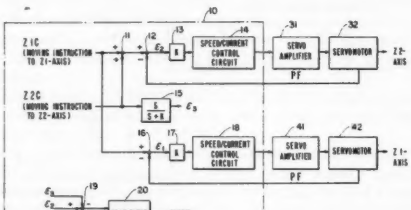
said load being controlled by said deviation.

5,025,200

SYNCHRONOUS CONTROL SYSTEM

Mitsuo Kurakake, Hino, and Jiro Kinoshita, Yamanashi, both of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

PCT No. PCT/JP89/00193, § 371 Date Oct. 10, 1989, § 102(e) Date Oct. 10, 1989, PCT Pub. No. WO89/08289, PCT Pub. Date Sep. 8, 1989
PCT Filed Feb. 23, 1989, Ser. No. 427,124
Claims priority, application Japan, Feb. 26, 1988, 63-043961
Int. Cl.[5] G05B *19/18*
U.S. Cl. 318—569 **12 Claims**



1. A synchronous control system for effecting a synchronous and superimposed operation among different channels of a multi-channel-control machine tool having servomotors, characterized in that a third follow-up error amount of a servomotor responsive to a superimposing instruction is simulated, a difference is determined by subtracting the third follow-up error amount to the superimposing instruction from a second follow-up error amount of a servomotor for a superimposed operation axis and said difference is compared with a first follow-up error amount of a servomotor for a synchronous operation axis to produce a comparison result, and determining an alarm condition when the operation of the servomotors is

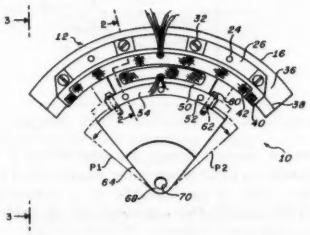
synchronized and superimposed based on the comparison result.

5,025,201

SEGMENTED RESOLVER

Alexander Berger, San Diego, Calif., assignor to Vernitron Corporation, San Diego, Calif.

Filed Mar. 14, 1990, Ser. No. 507,123
Int. Cl.[5] G05B *19/31*
U.S. Cl. 318—605 **11 Claims**



1. An electrical resolver, comprising:

an arcuate stator means, said stator means having a stator cylindrically curved magnetizable core with a predetermined circumferential length, said stator core having a concave side formed with a plurality of stator transverse slots;

a stator insulated coiled wire embedded in said stator slots, said stator coiled wire terminating in stator leads outside said stator core for connection to an external circuit;

an arcuate rotor means, said rotor means having a rotor cylindrically curved magnetizable core with a circumferential length shorter than that of said stator core, said rotor core having a convex side formed with a multiplicity of rotor transverse slots,

a rotor insulated coiled wire embedded in said rotor slots and terminating in rotor leads outside said rotor core, said rotor coiled wire inducing a first voltage in said stator coiled wire when said rotor leads are connected to an external electric power source,

said stator means and said rotor means being concentrically disposed with said convex side of said rotor core and said concave side of said stator core having a constant air gap thereinbetween; and

means connected to said rotor means for rotating same to a plurality of angular positions within an arc of predetermined length shorter than said circumferential length of said stator core, thereby changing said first voltage induced in said stator coiled wire to an extent determined by the extent of angular rotation of said rotor means, with respect to said stator means.

5,025,202

SOLAR CELL POWER SYSTEM WITH A SOLAR ARRAY BUS LOCKUP CANCELLING MECHANISM

Akihiko Ishii; Yukihiro Honda, and Toshio Matsui, all of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 7, 1990, Ser. No. 579,073
Claims priority, application Japan, Sep. 8, 1989, 1-233733; Oct. 13, 1989, 1-266559; Feb. 26, 1990, 2-44728
Int. Cl.[5] H02J *7/00*
U.S. Cl. 320—32 **26 Claims**

1. A solar cell power system with a solar array bus lockup cancelling mechanism, comprising:

a common return line;

a solar cell means having an output terminal and a terminal connected to said return line;

a shunt device connected in parallel between the output terminal of said solar cell means and said return line;

a power bus;

a first unilateral current transmission means which has an input terminal connected to the output terminal of said solar cell means and an output terminal connected to said power bus and which allows a current to flow only from the output terminal of said solar cell means toward said power bus;

a storage battery means having an output terminal and a terminal connected to said return line;

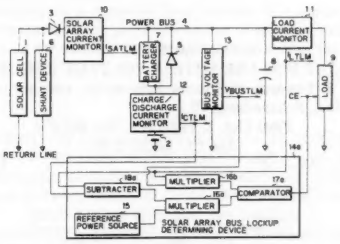
a charging means connected to said power bus and the output terminal of said storage battery means in series with said storage battery means;

a second unilateral current transmission means which has an input terminal connected to the output terminal of said storage battery means and an output terminal connected to said power bus and which allows a current to flow only from the output terminal of said storage battery means toward said power bus;

a charge storage means connected between said power bus and said return line;

a load which has a first terminal connected to said power bus, a second terminal connected to said return line, and a control terminal, said load reducing its own magnitude when a load power reducing signal is supplied to said control terminal;

a charge/discharge current monitor means which has an output terminal and which is connected to said storage



battery means to monitor the charge/discharge current that charges said storage battery means or that is discharged therefrom, emitting through said output terminal a signal representing the charge/discharge current thus monitored;

a bus voltage monitor means which has an output terminal and which is inserted between said power bus and said return line to monitor the bus voltage in said power bus, emitting through said output terminal a signal representing the bus voltage thus monitored;

a solar array current monitor means which has an output terminal and which is connected to said first unilateral current transmission means to monitor the solar array current flowing from said first unilateral current transmission means to said power bus, emitting through said output terminal a signal representing the solar array current thus monitored, or a load current monitor means which has an output terminal and which is connected to said load to monitor the load current, emitting through said output terminal a signal representing the load current thus monitored; and

a solar array bus lockup determining means which has three input terminals and an output terminal, two of said three input terminals being respectively connected to the output terminal of said charge/discharge current monitor means and the output terminal of said bus voltage monitor means, the remaining one input terminal being connected to either said solar array current monitor means or said load current monitor means, said output terminal being con-

nected to said control terminal of said load, said solar array bus lockup determining means including a reference voltage generating means for generating a reference voltage representing the regulated bus voltage when the solar cell power system is not in the solar array bus lockup state with the bus voltage being regulated by said shunt device, said solar array bus lockup determining further calculating the effective generated power of said solar cell means and the load power consumed by said load on the basis of the regulated bus voltage, the monitored bus voltage, the monitored discharge current, and either of the monitored solar array current or the monitored load current to generate a load power reducing signal at said output terminal when said effective generated power is greater than said load power;

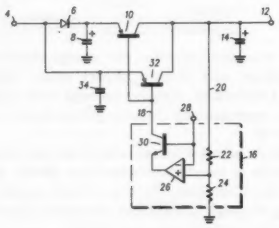
whereby the state is detected in which, during a period of sunlight, the bus voltage is fixed to the output voltage of said storage battery means and in which discharge from said storage battery means continues even though said solar cell means can manage to supply all the necessary load current so that the magnitude of said load is temporarily reduced to restore the state in which the bus voltage is regulated by said shunt device.

5,025,203

CIRCUIT FOR USE WITH A VOLTAGE REGULATOR

Arthur J. Edwards, Hoffmann Estates, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 2, 1989, Ser. No. 415,674
Int. Cl.[5] G05F *1/44*
U.S. Cl. 323—268 **10 Claims**



1. A circuit for use with a voltage regulator, comprising:

a first node for receiving an input voltage;

a second node for producing a regulated output voltage and for coupling to the voltage regulator;

a third node for connection to the voltage regulator to receive a control signal therefrom;

first control means having a voltage input coupled to the first node, a voltage output coupled to the second node, and a control input coupled to the third node, the first control means controlling the flow of current therethrough between the first node and the second node;

diode means coupled between the first node and the first control means voltage input; the improvement comprising

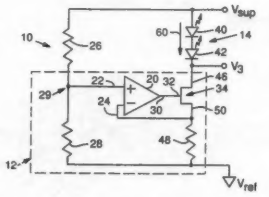
second control means having a voltage input connected to the first node, a voltage output coupled to the second node, and a control input coupled to the third node, the second control means controlling the flow of current therethrough between the first node and the second node.

5,025,204

CURRENT MIRROR USING RESISTOR RATIOS IN CMOS PROCESS

David K. Su, San Jose, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 5, 1990, Ser. No. 461,209
Int. Cl.[5] G05F *1/575*
U.S. Cl. 323—274 **4 Claims**



1. A current control device for establishing a controlled current through an LED wherein the magnitude of the current through the LED is proportional to a reference current through a reference current sense resistor, the current control device comprising:

a series combination of circuit elements including a controlled current sense resistor and a variation resistor responsive to a control signal applied to a control terminal thereof, the series combination being adapted for series coupling with said LED and between first and second voltage terminals; and

operational amplifier means having an output terminal coupled to said control terminal for providing said control signal, a first input terminal coupled to a sense point on said series combination, and a second input terminal receiving a substantially constant voltage signal corresponding to a voltage present at said sense point when the desired magnitude of current passes through said sense resistor, said substantially constant voltage signal being provided by a voltage divider network including first and second series coupled resistive elements;

wherein the reference current sense resistor is connected between the second operational amplifier input terminal and one of the first and second voltage terminals and wherein the current sense resistor and the second series coupled resistive elements are both fabricated in integrated circuit form so that a desired ratio of resistances therebetween may be accurately set.

5,025,205

RECONFIGURABLE ARCHITECTURE FOR LOGIC TEST SYSTEM

Marc R. Mydill, Garland; Sam R. Pile, Dallas; Sheila O'Keefe, Garland; Neal F. Okerblom, and W. Russ Keenan, both of Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 22, 1989, Ser. No. 372,506
Int. Cl.[5] G01R *31/28, 31/02*
U.S. Cl. 324—73.1 **31 Claims**

1. A reconfigurable logic test system for testing integrated circuits, including at least two test modules, a test module comprising;

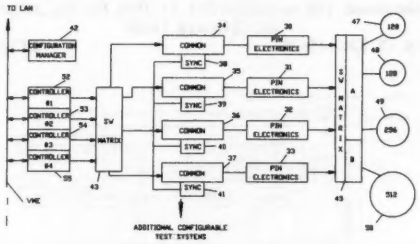
a program controller;

a first switching matrix;

a pin group electronic circuit, connected to said program controller by said first switching matrix;

a pin electronic circuit connected to the pin group electronic circuit;

a second switching matrix; and



at least one test head connectable to said pin electronic circuit by said second switching matrix.

5,025,206

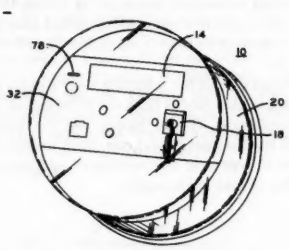
TEST MODE ACTUATOR AND INDICATOR FOR ELECTRONIC ENERGY METER

Warren R. Germer, Dover; Peter F. Coryea, Salem; Andrius A. Keturakis, Portsmouth, all of N.H.; David H. Masury, Kittery Point, and Thomas H. Stevens, Cape Neddick, both of Me., assignors to General Electric Company, Somersworth, N.H.

Filed Sep. 25, 1989, Ser. No. 411,940

Int. Cl.[5] G01R *35/04, 21/00*

U.S. Cl. 324—74 **41 Claims**



1. An integral test mode actuator and indicator in an electric energy meter comprising:

a register to indicate the amount of electricity used including a bezel support member and an associated meter readout;

an actuator/indicator member movably mounted within a recess associated with said bezel and having an off position, and an on position, and bearing a test mode indicia flag;

said actuator/indicator member being substantially obscured from view in said off position and including a switching component;

switch means having a switch actuator positioned in the path of said switching component and said activator/indicator;

movement of said actuator/indicator member from said off position to said on position moving said switching component into contact with said switch actuator to switch said member to the test mode;

said movement of said actuator/indicator member to the on position also moving said test mode indicia flag into the visible region associated with said meter readout; and

return of said actuator indicator member to the off position substantially removing said test mode indicia from view and back into said recess in said bezel and simultaneously moving said switching component away from contact with said switch actuator to switch said test mode of said meter off.

5,025,207

METHOD FOR THE MEASUREMENT OF A STEADY LEVEL IN A NOISE-INFESTED SIGNAL AND AUTOMATIC MEASURING DEVICE FOR THE APPLICATION OF THIS METHOD

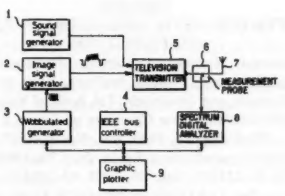
Dominique Gauthier, Ermont, France, assignor to Thomson-LGT Laboratoire General des Telecommunications, Conelans Sainte Honorine, France

Filed Jul. 19, 1989, Ser. No. 381,959

Claims priority, application France, Jul. 22, 1988, 88 09936

Int. Cl.[5] G01R *23/16*

U.S. Cl. 324—77 A **6 Claims**



1. A method for the measurement of the amplitude of a steady level in a noise-infested signal comprising the steps of:

sampling the signal during a time interval corresponding to the duration of the steady level to be measured;

quantifying the samples of the signal, according to a plurality of pre-determined digital values;

counting the number of samples, having each pre-determined digital value ;

determining, in a range of fixed values, that value which corresponds to the greatest number of samples, said value forming the measured value of the amplitude of the steady level.

5,025,208

METHOD OF MEASURING RADIO-FREQUENCY INTERFERING VOLTAGES

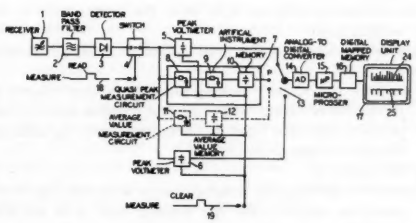
Klaus Danzeisen, Gräfelfing, Fed. Rep. of Germany, assignor to Rohde & Schwarz GmbH & Co KG, Fed. Rep. of Germany

Filed May 1, 1989, Ser. No. 346,082

Claims priority, application Fed. Rep. of Germany, May 21, 1988, 3817500

Int. Cl.[5] G01R *23/16;* **H04B** *17/00*

U.S. Cl. 324—77 R **4 Claims**



1. A method of measuring RFI voltages in a predetermined frequency range, comprising the steps of:

tuning the frequency range of a receiver and, during tuning of the frequency range, measuring the maximum and minimum peak voltage levels;

comparing the measured maximum peak voltage level with a predetermined limit value and interrupting tuning when the limit value is exceeded;

comparing the maximum peak voltage level with the minimum peak voltage level; and

evaluating the result of the comparison of the maximum peak voltage level with the minimum peak voltage level

by deciding in dependence of this comparison whether or not an additional quasi-peak measurement shall be performed and evaluated at the instantaneous frequency of interruption.

5,025,209

APPARATUS FOR DETECTING SURFACE POTENTIAL DISTRIBUTION

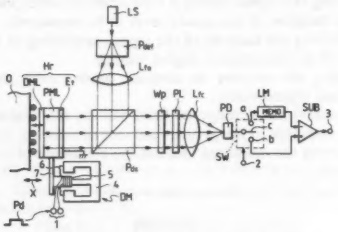
Itsuo Takanashi, Kamakura; Shintaro Nakagaki, Fujisawa; Hirohiko Shinonaga; Tsutou Asakura, both of Yokohama; Masato Furuya, and Hiromichi Tai, both of Yokosuka, all of Japan, assignors to Victor Company of Japan, Ltd., Japan

Filed Jun. 28, 1989, Ser. No. 372,507

Claims priority, application Japan, Jun. 30, 1988, 63-163477; Sep. 6, 1988, 63-223167; Sep. 20, 1988, 63-235407

Int. Cl.[5] G01R *31/00;* **G02F** *1/03*

U.S. Cl. 324—96 **2 Claims**



1. An apparatus for detecting a distribution of a surface potential on a measured object, comprising:

a light source emitting light;

a sensing head opposing the measured object and including an optical modulator layer for modulating the light emitted from the light source and outputting light, a transparent electrode for applying an electric field to the optical modulator layer, and a dielectric mirror for reflecting the light after the light passes through the optical modulator layer;

means for applying the light from the light source to the sensing head;

means for detecting the light outputted from the sensing head;

means for periodically moving the sensing head relative to the measured object between a first position and a second position separated from the measured object by different distances respectively;

a line memory;

means for enabling the sensing head to scan one line of the measured object while the sensing head is in the first position;

means for writing an output signal from the light-detecting means into the line memory while the sensing head is in the first position;

means for enabling the sensing head to scan said line of the measured object while the sensing head is in the second position;

means for reading out the written signal from the line memory while the sensing head is in the second position; and

means for subtracting the output signal from the light-detecting means from the read out signal while the sensing head is in the second position.

5,025,210

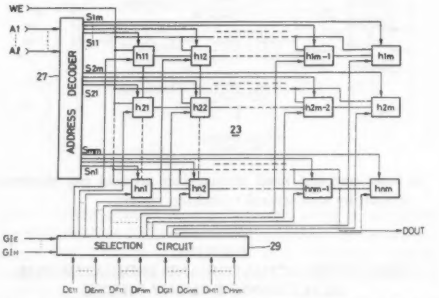
EVALUATION FACILITATING CIRCUIT DEVICE

Toshiyuki Yaguchi, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation-in-part of Ser. No. 886,914, Jul. 18, 1986, abandoned. This application Oct. 11, 1988, Ser. No. 255,284

Int. Cl.[5] G01R *19/00*

U.S. Cl. 324—158 R **2 Claims**



1. An evaluation facilitating circuit for evaluating a logical circuit which is divided into a plurality of blocks, comprising:

(a) latch means for latching level signals at each of the nodes in one of said blocks of said logical circuit, said latch means comprising a plurality of latch circuits arranged in a matrix array and a data hold and transfer control circuit for controlling the latch operation of each of said latch circuits and a transfer operation in which latched level signals are transferred externally, latched data in said latch means reflecting an instant condition of said nodes in one block; and

(b) a selection circuit for selecting level signals of nodes of one block of said blocks from the level signals of nodes of the other blocks of said blocks and for supplying said selected level signals of said one block to said latch means in order to represent a condition of said one block by a condition of said latch means.

5,025,211

TECHNIQUE FOR REDUCING ELECTROMAGNETIC INTERFERENCE

Adam B. Craft, Red Bank, and Gabor P. Torok, Holmdel, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 20, 1989, Ser. No. 453,721

Int. Cl.[5] G01R *31/02;* **H03H** *1/00*

U.S. Cl. 324—158 R **9 Claims**

1. A method of reducing electromagnetic interference on a circuit pack including at least one conductive path formed on a circuit board having two sides, said method comprising the steps of

allocating, during design of said circuit pack, at least one pair of areas on said circuit board for placement of electromagnetic interference absorbing material;

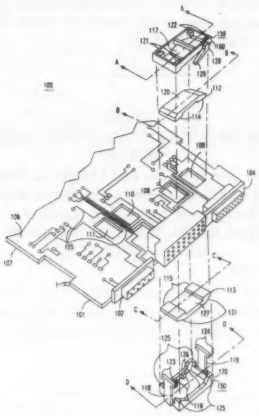
routing a predetermined portion of said conductive paths between said pair of areas;

fabricating said circuit pack;

testing said assembled circuit pack for compliance with predetermined criteria, said testing providing either a first or a second result; and

adding, only in response to a first result of said testing, electromagnetic interference absorbing material which

passes through holes in certain ones of said allocated pairs of areas, said material extending from said sides, the holes



being formed at any time prior to the addition of said material.

5,025,212

CIRCUIT FOR MEASURING THE DYNAMIC CHARACTERISTICS OF A PACKAGE FOR HIGH-SPEED INTEGRATED CIRCUITS AND A METHOD FOR MEASURING SAID DYNAMIC CHARACTERISTICS

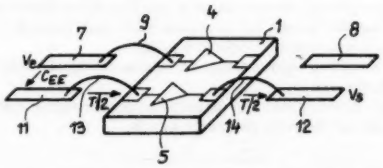
Maurice Gloanec, Bures sur Yvette; Jacques Jarry, St Cyr L'Ecole, and Jean L. Lailler, Bures sur Yvette, all of France, assignors to Thomson Hybrides et Microondes, Paris, France

Continuation of Ser. No. 122,125, Nov. 18, 1987. This application Nov. 3, 1989, Ser. No. 407,589

Claims priority, application France, Nov. 18, 1986, 86 15996

Int. Cl.[5] G01R *19/155*

U.S. Cl. 324—158 R **3 Claims**



2. A measuring circuit for measuring the dynamic characteristics of a package which is to be used for encapsulating an integrated circuit operated at or above one GHz, the integrated circuit having an input impedance and an output impedance, said measuring circuit comprising:

a supporting substrate of semiconductor material, said supporting substrate having a top portion, said top portion of said supporting substrate having a front and a back;

a first amplifier and a second amplifier connected to said top portion of said supporting substrate, said first amplifier and said second amplifier are identical and both have an input impedance and an output impedance identical to the input impedance and the output impedance of the integrated circuit;

a first metal contact of a first terminal of said first amplifier being located at the front of said top portion of said supporting substrate and a second metal contact of a second terminal of said first amplifier being located at the back of said top portion of said supporting substrate;

a first metal contact of a first terminal of said second amplifier being located at the front of said top portion of said supporting substrate and a second metal contact of a second terminal of said second amplifier being located at the back of said top portion of said amplifier;

said first and second metal contacts of said first amplifier being separated by a predetermined distance from said first and second metal contacts of said second amplifier;

wherein first amplifier and said second amplifier are mounted in an antiparallel manner; and

wherein the first metal contact of said first amplifier is an input metal contact and the first metal contact of said second amplifier is an output metal contact.

5,025,213

DEVICE FOR DETERMINING A LENGTH OF LINEAR MOVEMENT OR AN ANGLE OF ROTATION OF A MACHINE PART

Klaus Dobler, Gerlingen, and Hansjörg Hachtel, Weissach, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

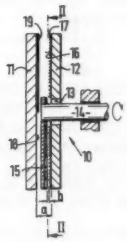
PCT No. PCT/DE88/00713, § 371 Date Jul. 26, 1989, § 102(e) Date Jul. 26, 1989, PCT Pub. No. WO89/05438, PCT Pub. Date Jun. 15, 1989

PCT Filed Nov. 17, 1988, Ser. No. 391,555

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1987, 3740800.3

Int. Cl.[5] G01B *7/14;* **H01F** *21/02, 21/04*

U.S. Cl. 324—207.12 **7 Claims**



1. A device for determining one of a length of a linear movement and an angle of rotation of a machine part, said device comprising spaced stationary first and second bodies; at least one coil arranged on one of said first and second bodies, another of said first and second bodies having on a surface facing said first body a surface portion of an electrically conductive material; and a diaphragm connectable to the machine part for joint displacement therewith and arranged in space between said first and second bodies for movement relative to said first and second bodies, said diaphragm having regions formed of an electrically conductive non-ferromagnetic material and regions formed of ferromagnetic material, said electrically conductive non-ferromagnetic regions and ferromagnetic regions alternating in such a manner that an inductive effect and an eddy current effect which result from axial oscillation of said diaphragm, upon flow of an alternating current of a predetermined frequency through said coil, cancel each other with respect to their electrical action on said coil.

5,025,214

CIRCUIT AND PROCESS FOR CONVERTING A HALF BRIDGE TRANSDUCER OUTPUT SIGNAL TO AN LVDT TRANSDUCER OUTPUT SIGNAL

Jeffrey A. Ross, Bellbrook, Ohio, assignor to The Warner & Swasey Company, Cleveland, Ohio

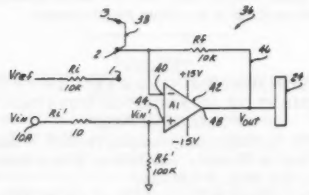
Filed Jun. 25, 1990, Ser. No. 542,509

Int. Cl.[5] G01B *7/14;* **G01F** *5/14*

U.S. Cl. 324—207.19 **6 Claims**

1. A converter circuit (36) for converting the amplitude only varied output of a half bridge transducer output signal to the

amplitude and phase varied output signal of an LVDT transducer output, the half bridge transducer (**10B**) comprising a pair of in series secondary windings (**16A, 16B**) juxtaposed to a movable plunger (**12**) acting as a transformer core, means for applying an exciting AC signal (V_{ref}) across said secondary windings (**16A, 16B**) to generate an output signal (V_{out}) at a point intermediate said secondary windings, said converter circuit including connection means for selectively applying said output signal (V_{out}) to said converter circuit as V_{in}, and



said converter circuit including combining means for combining said signal V_{in} with said exciting signal (V_{ref}) in said converter circuit to produce a converted output signal V_{out} (converted) according to the following formula:

$$V_{out}(Converted) = 2V_{in} - V_{ref}$$

whereby said converted output signal is amplitude and phase varied with said plunger position corresponding with an LVDT transducer output signal.

5,025,215

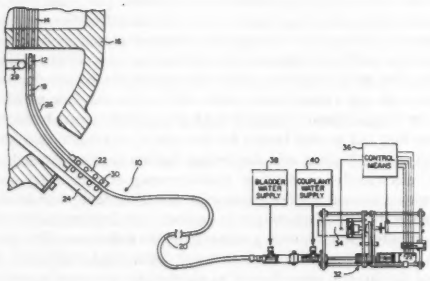
SUPPORT EQUIPMENT FOR A COMBINATION EDDY CURRENT AND ULTRASONIC TESTING PROBE FOR INSPECTION OF STEAM GENERATOR TUBING

William E. Pirl, Levelgreen, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 16, 1989, Ser. No. 394,702

Int. Cl.[5] **G01N** *27/82, 29/06;* **G21C** *17/017*

U.S. Cl. 324—220 **36 Claims**



36. An apparatus for helically moving an inspection probe within a tube comprising:

a head assembly insertable in a tube to be inspected for helically moving an inspection probe therein along a longitudinal axis of the tube, said head assembly comprising a first portion fixable to the tube by a fixing means and a second portion movably connected to said first portion by means for helically moving said second portion in response to driven rotary movement of said second portion with respect to the longitudinal axis of the tube, said second portion including means for detachably connecting an inspection probe thereto for helical movement therewith within a tube for inspection thereof; and

b. a drive frame assembly with drive means slidably mounted thereon, said drive means drivingly connected to said second portion of said head assembly by a conduit means connected between said drive motor and said second portion for imparting the driven rotary movement to said second portion, wherein helical movement of said second portion causes said drive means to move linearly along said drive frame assembly.

5,025,216

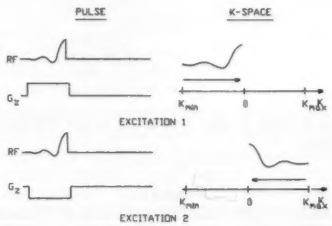
MAGNETIC RESONANCE IMAGING OF SHORT T_2 SPECIES

John M. Pauly, Menlo Park, and Dwight G. Nishimura, Palo Alto, both of Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Jul. 28, 1989, Ser. No. 386,901

Int. Cl.[5] **G01R** *33/20*

U.S. Cl. 324—309 **6 Claims**



1. A method of obtaining slice-selective magnetic resonance signals comprising the steps of

(a) applying a static magnetic field (B_0) to a body thereby aligning nuclear spins,

(b) applying a modulated magnetic gradient (G(t)) to said body,

(c) applying a first RF excitation pulse ($B_1(t)$) to said body to tip said nuclear spins,

(d) detecting first magnetic resonance signals from said body,

(e) applying a second RF excitation pulse ($B_1(t)$) to said body to tip said nuclear spins, said first RF excitation pulse and said second RF excitation pulse each being half of a conventional slice-selective pulse,

(f) detecting second magnetic resonance signals from said body, and

(g) combining said first magnetic resonance signals and said second magnetic resonance signals.

5,025,217

METHOD OF AND DEVICE FOR EDDY CURRENT COMPENSATION IN MR APPARATUS

Johannes J. Van Vaals, Eindhoven, Netherlands, assignor to U. S. Philips Corporation, New York, N.Y.

Filed Sep. 8, 1989, Ser. No. 404,913

Claims priority, application Netherlands, Sep. 8, 1988, 8802212

Int. Cl.[5] **G01R** *33/20*

U.S. Cl. 324—322 **16 Claims**

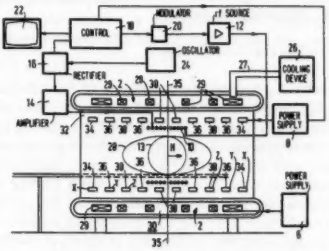
1. A method for compensating for object eddy current effects produced by magnetic fields in a magnetic resonance apparatus comprising:

measuring first rf resonance signals generated in response to a non-compensated gradient field applied to a measurement object occupying a space of a volume of interest within a measurement space of the apparatus;

measuring second rf resonant signals generated by said object in said measurement space in response to magnetic

field phenomena in said measurement space in the absence of said gradient field;

comparing the first and second resonant signals; and



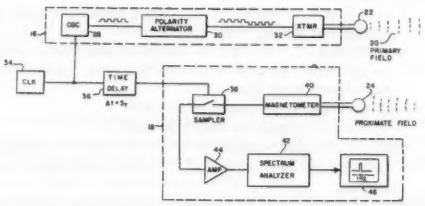
generating correction signals manifesting errors due to said field phenomena for said non-compensated gradient field to compensate for said eddy current effects on said object.

5,025,218

PULSED FIELD SYSTEM FOR DETECTING THE PRESENCE OF A TARGET IN A SUBSURFACE ENVIRONMENT

Clarence F. Ramstedt, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 23, 1979, Ser. No. 32,815
Int. Cl.[5] G01V *3/08, 3/10, 3/12*
U.S. Cl. 324—334 **11 Claims**



1. A method for searching a subsurface environment to detect the presence of a target in the environment, said method comprising the steps of:

emitting an electromagnetic field comprising successive electromagnetic pulses of selected duty cycle, the time interval between pulses comprising a zero emission interval and a sampling interval, the sampling interval following the zero emission interval, the polarity of successive pulses alternating at a selected alternating frequency;

projecting said emitted field into said environment from a selected location;

sampling the electromagnetic field proximate to said selected location during each of said sampling intervals to provide a train of proximate field samples; and

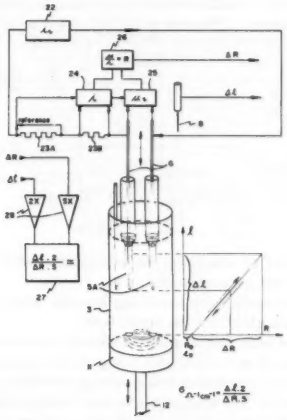
spectrum analyzing said train of field samples to detect the presence in said proximate field of a field component having a frequency which is equal to said alternating frequency.

5,025,219

APPARATUS AND METHOD FOR CONTINUOUS MEASUREMENT OF THE ELECTRICAL CONDUCTIVITY OF LIQUID MEDIA IN A DYNAMIC CELL

Jean R. Gaspard, St. Jean De Maurienne, France, assignor to Pechiney Recherche, Paris, France

Filed Sep. 19, 1989, Ser. No. 409,058
Claims priority, application France, Sep. 20, 1988, 88 12704
Int. Cl.[5] G01N *27/02*
U.S. Cl. 324—447 **18 Claims**



1. Device for precise, continuous and dynamic measurement of the electrical resistivity σ of a liquid L, at a temperature which may range from low cryogenic temperatures to approximately 2000° C., characterized in that it includes in combination:

a dynamic measurement cell **2** including at least one conduit **5** of electrically insulating material in which a conductive electrode **6** can slide in an alternating periodic motion of amplitude **1**, the lower portion of the conduit **5** being calibrated over a length equal to at least **1**, and having a cross section s, said cell **2** being immersed in a crucible **3** containing the liquid L at the constant, and adjusted temperature;

a generator **22** of periodic current of frequency f, connected in series with the cell **2** that it supplies at an effective intensity i;

a device **10** for controlling, adjusting and measuring the amplitude of the displacement **1** of each electrode **6**;

a means **8** for measuring and adjusting the depth of immersion of each electrode or group of electrode **6** in the liquid L;

a device for adjusting and measuring the speed of displacement $\Delta 1/\Delta t$ of the electrode **6** in the conduit **5**;

a means of measuring the variation in ohmic resistance R of the cell as a function of the displacement of the electrode **6**: $\Delta R/\Delta 1$ based on the measurement of the voltage u at the terminals of the cell and of the effective intensity i of the current passing through it, by synchronous, in-phase detection of u and i;

the value of the conductivity o of the liquid L then being equal to:

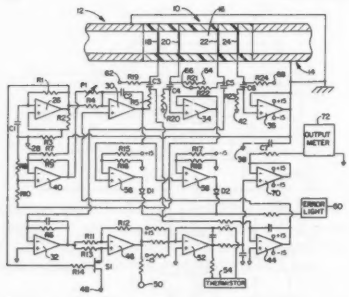
$$\sigma = \frac{n \cdot \Delta l}{s \cdot \Delta R}$$

where n is the number of electrodes **6** of the cell **2**.

5,025,220
CONTINUOUS MEASUREMENT OF THE ABSOLUTE CONDUCTIVITY OF A LIQUID

Alex D. Colvin, Oak Park; Daniel J. Graham, Farmington, and Joseph C. Cassatta, Taylor, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Sep. 21, 1989, Ser. No. 410,772
Int. Cl.[5] G01N *27/02*
U.S. Cl. 324—449 **9 Claims**



1. A method of measuring the electrical conductivity of a liquid comprising the steps of:

forming an electrically insulating housing which defines a path through which the liquid flows;

inserting at least four electrodes into the path of said housing, two of said electrodes being current electrodes and two of said electrodes being voltage electrodes;

measuring the AC voltage across said voltage electrodes;

driving a first one of said current electrodes to maintain the AC voltage on said voltage electrodes at a constant value;

measuring the current flowing in a second one of said current electrodes to determine the electrical conductivity of the liquid;

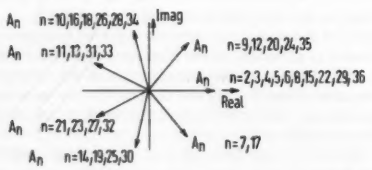
providing a DC bias voltage source; and

coupling said DC bias voltage source to said at least four electrodes to prevent coating or plating said electrodes.

5,025,221
METHOD FOR MEASUREMENT OF ATTENUATION AND DISTORTION BY A TEST OBJECT

Gerhard Blaess, Olching, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 3, 1981, Ser. No. 269,991
Claims priority, application Fed. Rep. of Germany, Jun. 27, 1980, 3024346
Int. Cl.[5] H04B *3/46*
U.S. Cl. 324—603 **8 Claims**



1. A method for measuring the transmission properties of a test subject to which a test pulse of finite duration is supplied and the deformation of said test pulse caused by the test subject is interpreted, whereby the pulse reply is dissected with a computer with the assistance of Fourier analysis and whereby the transmission properties of the test subject are identified from said test pulse, comprising the steps of:

forming said test pule by superimposing for said duration, a series of (x) differing consecutive harmonics of a frequency f having amplitudes and starting phases according to the following equation

$$V(t)=\Sigma A_n \cos(2\pi \cdot n \cdot f \cdot t - \theta_n)$$

whereby A_n denotes the amplitude of the nth component and θ_n denotes the value of the starting phase of the nth harmonic n·f, whereby the values of the starting phase·(θ_n) are distributed into an integral number k groups of components, with each group having an integral number of components equal to x/k, each group having a unique phase-spacing parameter m taken from the set (0, 1 . . . k−1) with m=0 for the first group and m32 k−1 for the kth group, whereby the starting phase θ_n of the harmonics is determined by the relationship

$$\theta_n = g(n)\frac{2\pi}{k}m,$$

in which g(n) represents a value increasing with increasing ordinal number n;

and applying said test pulse to said test subject, whereby the deformation of said test pulse caused by said test subject may be interpreted.

5,025,222
SYSTEM AND METHOD FOR MONITORING SUBSTANCES AND REACTIONS

Bentley N. Scott, Richardson, and Samuel R. Shortes, Lewisville, both of Tex., assignors to Phase Dynamics, Inc., Richardson, Tex.

Continuation-in-part of Ser. No. 376,782, Jul. 7, 1989, Pat. No. 4,996,490, which is a continuation-in-part of Ser. No. 932,068, Nov. 18, 1986, Pat. No. 4,862,060. This application Nov. 27, 1989, Ser. No. 442,980
Int. Cl.[5] G01R *27/26*
U.S. Cl. 324—639 **14 Claims**

1. A system for controlling a process, comprising:

a voltage-controlled oscillator, which includes

a gain element capable of providing substantial gain at frequencies greater than 100 MHz;

a feedback path, coupling the output of said gain element to the input thereof, said feedback path including a tunable resonant circuit;

an electromagnetic propagation structure

which is RF-coupled to load said oscillator

and in which electromagnetic wave propagation is electrically loaded by a portion of a medium undergoing said process;

means for monitoring the frequency and insertion loss of said oscillator to ascertain changes in the composition of the medium; and

means for controlling one or more process variables in accordance with the output of said monitoring means.

5,025,223
FLATNESS TESTER

Tempel Smith, Jr.; Veselko Miletic, both of Chicago; George Bayer, Kildeer; Christopher A. Coutre, Addison; William L. Reichel, Chicago, and Mirek J. Chronowski, Niles, all of Ill., assignors to Tempel Steel Company, Niles, Ill.

Filed Jul. 24, 1989, Ser. No. 383,616
Int. Cl.[5] G01R *27/26*
U.S. Cl. 324—662 **13 Claims**

1. Apparatus for determining an overall dimension of an object, comprising:

a support surface for receiving the object;

an electrically conductive plate movable toward and away

from the support surface along a path normal to such surface, the plate having a facing surface which faces the support surface;

means for forming an electrical characteristic between the object and the plate;

means for developing a distance signal representing the distance between the facing surface and the support surface;

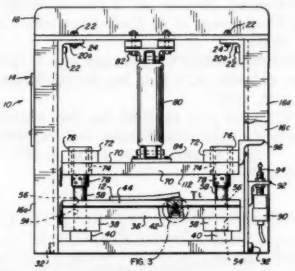


FIG. 3

means for moving the plate toward the object while the object is received by the support surface; and

means for detecting when the electrical characteristic between the object and the plate changes due to contact of the plate with the object whereby the distance signal at such time is representative of the overall dimension.

5,025,224

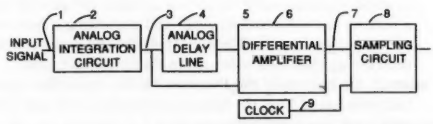
INCREMENTAL INTEGRATOR CIRCUIT

Melvin H. Rhodes, Cedar Rapids, Iowa, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 8, 1989, Ser. No. 447,749

Int. Cl.[5] G06G *7/12, 7/14, 7/18*

U.S. Cl. 328—127 **2 Claims**



1. An incremental integrator which receives and integrates an input signal from a signal source to obtain an average value of said input signal over a sequence of time intervals, said incremental integrator comprising:

an analog integration circuit which produces an output signal by receiving and integrating said input signal from said signal source over said sequence of time intervals, said analog integration circuit thereby producing an integrated input signal for each time interval;

a means for delaying signals for a period of time which equals one of said time intervals, said delaying means being connected with and receiving said integrated input signal from said analog integration circuit, said delaying means thereby producing a delayed integrated signal;

a differential amplifier which receives and subtracts said delayed integrated signal from said delaying means, from the integrated input signal from said analog integration circuit during each time interval, said differential amplifier outputting a difference signal which is proportional to a value which equals a difference in amplitude between the delayed integrated signal and the integrated input signal of a current time interval,

a clock circuit which produces a clock signal which has pulses which have durations which equal said time intervals of said analog integration circuit and said delaying means; and

a means for sampling signals, said sampling means receiving and sampling said difference signal from said differential amplifier and said clock signal from said clock circuit to output a sampled signal proportionate to the average value of said input signal over each of said sequence of time intervals.

5,025,225

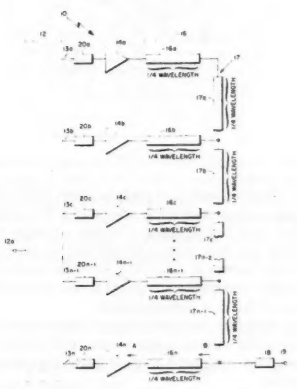
AMPLIFIER HAVING SUBSTANTIALLY CONSTANT D.C. TO R.F. CONVERSION EFFICIENCY

Yusuke Tajima, Acton, and Robert G. Gels, Boston, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Dec. 15, 1989, Ser. No. 452,165

Int. Cl.[5] H03F *3/68*

U.S. Cl. 330—124 D **1 Claim**



1. A high conversion efficiency power amplifier, comprising:

a plurality of amplifiers, each having an input fed by an input signal, and an output; and

a power combiner comprising:

a corresponding plurality of quarter wavelength transmission lines, each having a first end coupled to the output of the corresponding one of said plurality of amplifiers; and

a second, different plurality of quarter wavelength transmission lines, each having first and second ends, a first one of said second plurality of transmission lines having a first end thereof coupled to a second end of the first one of the first plurality of transmission lines, and the second end thereof coupled to the second end of the second one of the first plurality of transmission lines, and a succeeding one of said second plurality of transmission lines having a first end coupled to a preceding one of said first plurality of transmission lines and a second end coupled to succeeding one of said first plurality of transmission lines.

5,025,226

HIGH-GAIN LOW-NOISE AMPLIFIER

Stewart S. Taylor, Beaverton, Oreg., assignor to TriQuint Semiconductor, Inc., Beaverton, Oreg.

Filed Mar. 2, 1990, Ser. No. 487,360

Int. Cl.[5] H03F *3/16*

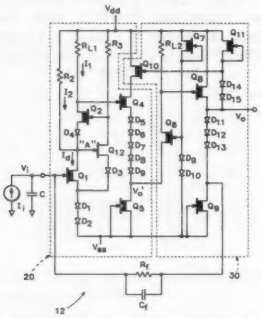
U.S. Cl. 330—277 **19 Claims**

1. A high-gain, low-noise multiple stage solid-state amplifier, comprising:

phase-inverting input stage means including a first FET for

receiving a time-varying input signal and an output FET configured as a source follower, wherein a source terminal of the output FET presents a relatively low output impedance and provides a first output signal representing a substantially phase-inverted version of the input signal having a magnitude amplified by an input stage gain value; and

phase non-inverting output stage means receiving the first output signal for providing a second output signal representing a substantially phase-inverted version of the input signal having a magnitude amplified by the product of an



output stage voltage gain and the input stage voltage gain, the output stage including a second FET connected in a common gate configuration having a source terminal for receiving the first output signal and an output terminal, the source terminal receiving the first output signal and the output terminal providing a non-inverted amplified version of the first output signal;

whereby the phase-inverting input stage means and phase non-inverting output stage means cooperate to provide the amplifier with high overall gain and wide bandwidth properties.

5,025,227

METAL DETECTION CIRCUIT

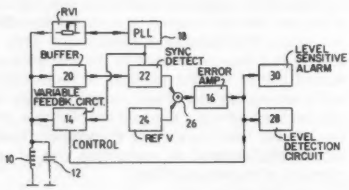
Richard J. Walton, Johannesburg, South Africa, assignor to William Young, Sandton, Transvaal, South Africa

Filed Oct. 11, 1989, Ser. No. 420,036

Claims priority, application South Africa, Oct. 11, 1988, 88/7568

Int. Cl.[5] G01N *27/00*

U.S. Cl. 331—65 **5 Claims**



1. Metal detection apparatus comprising:

an oscillator circuit including a detection coil

detector means for rectifying an output of the oscillator circuit synchronously with a frequency of oscillation thereof;

comparison means for comparing a rectified output of the oscillator circuit from the detector means with a reference signal and for generating an output signal having a value related to an amplitude of the output of the oscillator circuit; and

positive feedback means for generating a positive feedback signal and for applying it to the oscillator circuit to maintain oscillation thereof at a predetermined amplitude under quiescent conditions.

5,025,228

ULTRASTABLE OSCILLATOR FUNCTIONING AT ATMOSPHERIC PRESSURE AND UNDER VACUUM

Evelyne Gerard, Maisons-Lafitte; Roger Molle, Antony, and Andre Debaisieux, Herblay, all of France, assignors to Compagnie D'Electronique et de Piezo-Electricite C.E.P.E., Argenteuti, France

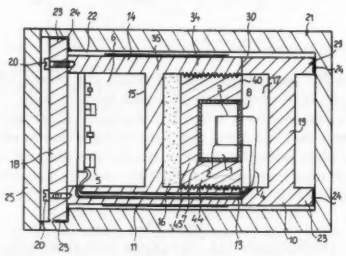
PCT No. PCT/FR89/00307, § 371 Date Apr. 11, 1990, § 102(e) Date Apr. 11, 1990, PCT Pub. No. WO89/12929, PCT Pub. Date Dec. 28, 1989

PCT Filed Jun. 16, 1989, Ser. No. 460,969

Claims priority, application France, Jun. 24, 1988, 8808523

Int. Cl.[5] H03B *5/32;* H03L *1/04*

U.S. Cl. 331—69 **16 Claims**



1. Oscillator of ultrastable frequency functioning at atmospheric pressure and under vacuum, comprising:

a piezoelectric resonator having a piezoelectric reed encased in a housing having a cap and a base;

the resonator being placed inside a thermostatically controlled containment comprising sides limited by a bottom and by at least one cover, wherein the thermostatically controlled containment comprises an outer cell possessing a bottom and sides and an inner cell possessing a bottom and sides, the inner cell being fitted into the outer cell in such a way that their sides are in direct contact; and

wherein the bottom of the thermostatically controlled containment has at least the bottom of the outer cell and the bottom of the inner cell.

5,025,229

VOLTAGE-CONTROLLED OSCILLATOR USING A SURFACE ELASTIC WAVE RESONATOR

Makoto Hasegawa, Tokyo; Kazuaki Takahashi, Kawasaki; Mitsuo Makimoto, Yokohama; Masao Takahashi, Chigasaki, and Takayuki Shimazu, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed May 24, 1990, Ser. No. 528,079

Claims priority, application Japan, Jun. 1, 1989, 1-140452

Int. Cl.[5] H03B *5/30*

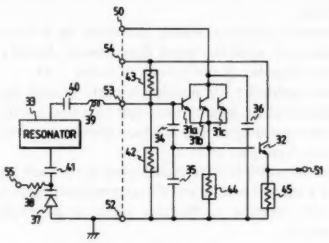
U.S. Cl. 331—107 A **2 Claims**

1. A Colpitts voltage-controlled oscillator comprising:

an integrated circuit including a transistor comprising a parallel combination of sub transistors, a bypass capacitor connected between a collector of the transistor and a ground, a first feedback capacitor connected between a base and an emitter of the transistor, a second feedback capacitor connected between the emitter of the transistor and the ground, and an emitter follower connected to the emitter of the transistor; and

a series combination of an inducer, a surface elastic wave

resonator, and a variable capacitance diode, the series combination being disposed outside the integrated circuit



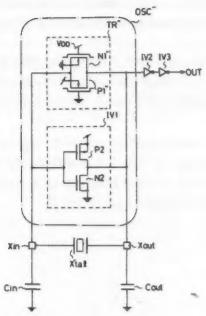
and being connected between the base of the transistor and ground.

5,025,230

OSCILLATOR CIRCUIT INCORPORATED IN A SEMICONDUCTOR CIRCUIT

Hitoshi Kondo, Yokohama; Hiroyuki Suwabe, Odawara, and Aiki Kojima, Yamato, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 16, 1990, Ser. No. 524,017
Claims priority, application Japan, May 17, 1989, 1-123762
Int. Cl.[5] H03B *5/36*
U.S. Cl. 331—116 FE **8 Claims**



1. An oscillator circuit incorporated in a semiconductor integrated circuit and having an oscillation input terminal and an oscillator output terminal to which an external oscillator is connected, said oscillator circuit comprising:

an inverting logic circuit comprising transistors formed on the semiconductor substrate of said semiconductor integrated circuit, connected to receive a signal input through said oscillation input terminal, and adapted to supply an output signal through said oscillation output terminal;

an N-type MOS transistor formed on said semiconductor substrate, and having a source electrode and a drain electrode one of which is connected to said oscillation input terminal, and the other of which is connected to said oscillation output terminal, and a gate electrode which is connected to receive a first potential for turning on the N-type MOS transistor; and

a P-type MOS transistor formed on said semiconductor substrate, and having a gate-insulating film, a source electrode and a drain electrode, one of which is connected to said oscillation input terminal, and the other of which is connected to said oscillation output terminal, and a gate electrode which is connected to receive a second potential for turning on the P-type MOS transistor,

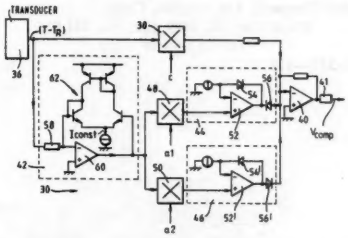
wherein the gate-insulating film of at least one of said MOS transistors is thicker than those of other MOS transistors formed on said semiconductor substrate.

5,025,231

TEMPERATURE-CONTROLLED CRYSTAL OSCILLATOR CIRCUIT

Bjarne Schwartzbach, Cambridge, England, assignor to U.S. Philips Corp., New York, N.Y.

Filed May 25, 1990, Ser. No. 529,044
Claims priority, application United Kingdom, Jun. 9, 1989, 8913322
Int. Cl.[5] H03B *5/36;* **H03L** *1/02*
U.S. Cl. 331—116 R **14 Claims**



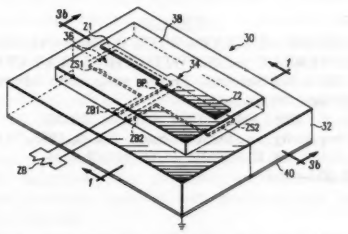
1. A method of temperature controlling a crystal oscillator circuit including a crystal and a frequency pulling element, the method comprising generating a compensating voltage in accordance with a function formed by a linear term, an exponential term and an inverse exponential term, and applying the compensating voltage to the frequency pulling element.

5,025,232

MONOLITHIC MULTILAYER PLANAR TRANSMISSION LINE

Anthony M. Pavio, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 31, 1989, Ser. No. 429,679
Int. Cl.[5] H01P *5/10*
U.S. Cl. 333—26 **12 Claims**



1. A multilayer planar transmission line, comprising:

(a) a dielectric substrate with substantially planar opposing surfaces of a predetermined planar configuration;

(b) an interlevel conductive layer configured by at least one balance point gap, such that separate transmission lines are provided between each of the interlevel conductor sections and, respectively, a top conductive layer and a groundplane reference;

(c) an interlevel dielectric layer of a predetermined planar configuration disposed over said interlevel conductor with a predetermined dielectric constant significantly thinner than said substrate;

(d) said top conductive layer being of predetermined planar configuration disposed over said interlevel dielectric layer;

(e) said groundplane conductive layer disposed on the op-

posing substantially planar surface of said substrate, providing a groundplane reference for said top conductive layer and said interlevel conductive layer to provide three transmission lines, a top/interlevel transmission line, an interlevel/groundplane transmission line, and a top/-groundplane transmission line with predetermined impedance characteristics;

(f) input terminals across one of said sections of said interlevel conductive layer and said top conductive layer; and

(g) a load coupled across said balance point gap.

5,025,233

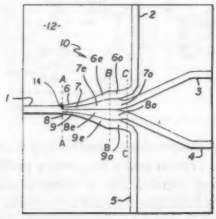
BROADBAND POWER DIVIDER

George L. Leonakis, Redondo Beach, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Mar. 31, 1989, Ser. No. 331,555

Int. Cl.[5] H01P *5/02*

U.S. Cl. 333—128 **16 Claims**



1. A broadband power divider comprising:

an input section of conductive material;

N tapered sections of conductive material, where N is greater than or equal to 2, extending from and integral with said input section, each of said tapered sections including an even mode subsection having a first taper and an odd mode subsection having a second taper; and

N output sections of conductive material, each output section being electromagnetically decoupled from the other output sections and each output section extending from and integral with a respective one of said tapered sections.

5,025,234

TRANSVERSAL FILTER WITH WIDE BAND PHASE SHIFTERS IN SERIES WITH THE DELAY CELLS

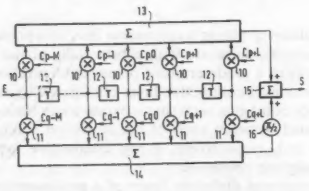
Olivier De Luca, Suresnes, France, assignor to Alcatel N.V., Amsterdam, Netherlands

Filed Feb. 8, 1989, Ser. No. 308,308

Claims priority, application France, Feb. 9, 1988, 88 01504

Int. Cl.[5] H03H *15/00*; H04B *3/14*

U.S. Cl. 333—166 **7 Claims**



1. A transversal filter for filtering an input signal comprising an intermediate carrier having an in-phase portion and a quadrature portion, said filter comprising:

a linear array of M+L+1 branches and comprising

a central branch having an associated index i=0,

L trailing branches each having a respective positive index i where $+1 \leqq i \leqq +L$, and

M leading branches each having a respective negative index i where $-M \leqq i \leqq -1$;

wherein each of said M+L+1 branches further comprises

a branch midpoint which functions as a branch input terminal, with the input signal being directly input to the midpoint of the branch of index −M,

a first multiplier for multiplying any branch input signal present at the branch midpoint by a first coefficient Cp_I corresponding to said in-phase portion to provide a first branch output, and

a second multiplier for multiplying the branch input signal by a second coefficient Cq_I corresponding to said quadrature portion to thereby produce a second branch output;

M+L delay cells each providing a delay T;

M+L wideband phase shifters each connected in series with a respective one of said M+L delay cells, the series connection of each phase shifter and its respective delay cell being coupled between the branch midpoint of a respective branch of index i and the branch midpoint of an immediately succeeding branch of index i+1 where $-M \leqq i < L$, each said phase shifter providing a phase shift $\delta\phi$ such that $\delta\phi = \Omega_O T$ (modulo 2π) where Ω_O is the angular frequency of the intermediate carrier;

a first summing circuit for summing the outputs of the first multipliers to provide a first summing circuit output;

a second summing circuit for summing the outputs of the second multipliers to provide a second summing circuit output;

a $\pi/2$ phase shifter responsive to the output of the second summing circuit to provide a $\pi/2$ phase shifter output; and

a third summing circuit for summing the output of the first summing circuit and the output of the $\pi/2$ phase shifter, said third summing circuit providing an output of the filter,

whereby any intermediate carrier signal present at the branch midpoint of index i is subjected to a delay of i.T and a phase shift of $i.\delta\phi$ relative to a corresponding signal at the branch midpoint of index 0.

5,025,235

MICROSTRIPLINE INTERDIGITAL PLANAR FILTER

Protap Pramanick, Cambridge, Canada, assignor to Com Dev Ltd., Cambridge, Canada

Filed Apr. 27, 1989, Ser. No. 343,801

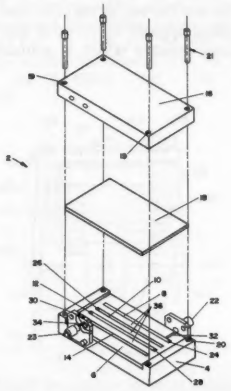
Claims priority, application Canada, Feb. 9, 1989, 590567

Int. Cl.[5] H01P *1/203*

U.S. Cl. 333—204 **11 Claims**

1. A microstripline interdigital planar filter comprising a housing containing a dielectric substrate having a moderate dielectric constant, a plurality of microstrip resonators being located on said substrate in the form of a metal pattern, all resonators of said filter being located in a common plane a cover for the metal pattern, said cover being spaced apart from said metal pattern when mounted on said housing to create a space therebetween, a dielectric superstrate of a size and thick-

ness to completely cover said resonators and to fill said space being located between the metal pattern and said cover, said



superstrate is ceramic having a high dielectric constant and a high Q, said filter having an input and output.

5,025,236

CIRCUIT BREAKER

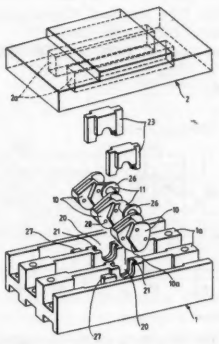
Masao Miura; Naoshi Uchida; Tatsunori Takahashi; Kouji Asakawa, and Eiji Nozawa, all of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Aug. 27, 1990, Ser. No. 572,467

Claims priority, application Japan, Sep. 7, 1989, 1-232068; Mar. 20, 1990, 2-71071; May 31, 1990, 2-142225

Int. Cl.[5] H01H *75/00*

U.S. Cl. 335—46 **8 Claims**



1. A circuit breaker comprising:

an open-and-close shaft;

holder means for holding a movable contactor, said holder means being coupled to said open-and-close shaft;

support means for rotatably supporting said open-and-close shaft;

and stopper means for stopping said open-and-close shaft, said stopper means being coupled with said support means so as to restrict an open-and-separation position of said movable contactor, wherein said circuit breaker is disposed within a case, said stopper means are formed on side faces of between-phase partitions of said case and a portion of said holder means contacts said stopper means.

5,025,237

RELAY DEVICE FOR SWITCHING RADIO FREQUENCY SIGNAL

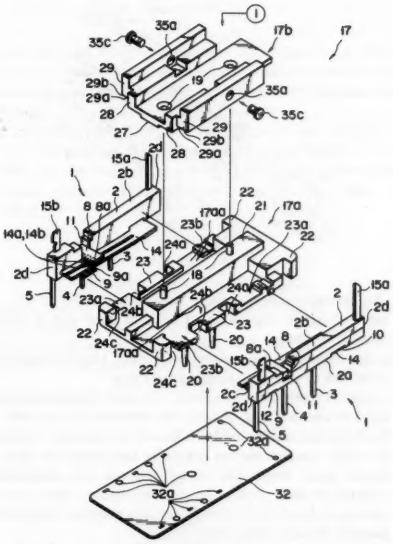
Syoji Yamazaki, Isehara; Toshikazu Oda, Hadano; Kenji Iwanaga, and Yoshitaka Gono, both of Atsugi, all of Japan, assignors to Anritsu Corporation, Tokyo, Japan

Filed Sep. 22, 1989, Ser. No. 411,548

Claims priority, application Japan, Sep. 28, 1988, 63-240769; Sep. 28, 1988, 63-240770; Aug. 28, 1989, 1-220676

Int. Cl.[5] H01H *51/22*

U.S. Cl. 335—83 **16 Claims**



1. A relay device for switching a radio frequency signal, said device comprising:

first and second contact blocks each having a substantially rectangular insulating member, a pair of stationary contact members projecting inward from said insulating member and supported with a predetermined interval therebetween, a movable contact member arranged between said pair of stationary contact members and supported by said insulating member, and first, second, and third terminals for electrically extracting said pair of stationary contact members and said movable contact member, respectively, and projecting from a base portion of said insulating member with predetermined intervals therebetween;

an electromagnet having a movable member for commonly acting on said movable contact members of said first and second contact blocks to move each movable contact member toward one of said pair of stationary contact members of each of said first and second contact blocks;

a shielding block member with a substantially H-shaped section, having two storage spaces for storing said first and second contact blocks, respectively, a support portion for mounting said electromagnet, and a predetermined number of notched portions for guiding said first, second, and third terminals of each of said first and second contact blocks, at least a surface of said shielding block member being conductive; and

a shielding case for shielding at least an edge of an opening portion of said shielding block member.

5,025,238

ELECTROMAGNETIC RELAY

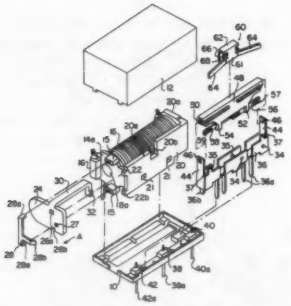
Ken-iti Matuo; Muneo Nakata; Mitukazu Hori, and Isaji Tanihara, all of Nagano, Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Continuation of Ser. No. 334,631, Apr. 7, 1989, abandoned. This application Apr. 12, 1990, Ser. No. 508,494

Claims priority, application Japan, Apr. 7, 1988, 63-86156; Apr. 8, 1988, 63-86628; May 13, 1988, 63-63138[U]

Int. Cl.[5] H01H *67/02*

U.S. Cl. 335—128 14 Claims



1. An electromagnetic relay, comprising:

a electromagnet consisting of an iron core and a solenoid wound thereon;

a yoke extending in parallel with said electromagnet and attached to one end of said iron core;

an armature pivotally attached to a part of said yoke adjacent to another end of said iron core at its base end;

a fixed contact unit provided adjacent to said electromagnet;

a movable contact carrier pivotally supported on each end by an axial projection along a pivot axis substantially parallel to said iron core, said movable contact carrier having at least one movable contact member substantially parallel to said pivot axis;

wherein at least one pair of fixed contact members is provided in said fixed contact unit and aligned along an axis parallel to said pivot axis;

an extension arm extending from said armature and having a free end adapted to abut an actuation point of said movable contact carrier located between said pivot axis and said movable contact member carried thereby;

said movable contact member being adapted to come into contact with and move apart from said pair of fixed contact members provided in said fixed contact unit by pivotally moving said movable contact carrier.

5,025,239

ELECTROMAGNETIC ACTUATOR FOR CAMERAS AND THE LIKE

Toshihiko Ishimura; Akira Okuno; Nobuharu Murashima; Hideo Kajita; Yasao Hawai; Junichi Tanii, and Reiji Seki, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 30, 1989, Ser. No. 330,450

Claims priority, application Japan, Apr. 1, 1988, 63-78093; Apr. 1, 1988, 63-78094; Apr. 11, 1988, 63-87386; May 11, 1988, 63-115401; May 11, 1988, 63-115402; May 11, 1988, 63-115403

Int. Cl.[5] H01F *7/08, 3/00;* G03B *7/08*

U.S. Cl. 335—265 5 Claims

1. An electromagnetic actuator, comprising:

a core formed of a magnetic material;

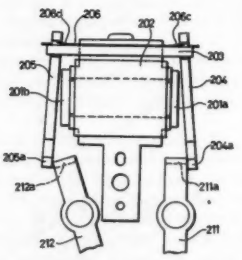
a coil wound around said core;

a yoke formed of a magnetic material and extended substantially in parallel to an axis of said core;

a first armature formed of a magnetic material and supported at one end thereof on one end of said yoke so as to be located opposite to one end of said core;

a second armature formed of a magnetic material and supported at one end thereof on the other end of said yoke so as to be located opposite to the other end of said core;

a first operating member which is actuated by said first armature;



a second operating member which is actuated by said second armature; and

a positioning and holding device which positions and holds one of said armatures on a corresponding end of said core before the other armature is attracted to the other corresponding end of said core.

5,025,240

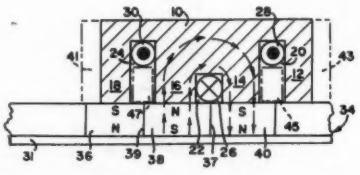
METHOD AND APPARATUS FOR FORMING MAGNETIZED ZONES ON A MAGNETIZABLE BODY

Mark E. La Croix, New Hartford, Conn., assignor to The Torrington Company, Torrington, Conn.

Filed Aug. 30, 1989, Ser. No. 400,635

Int. Cl.[5] H01F *13/00*

U.S. Cl. 335—284 10 Claims



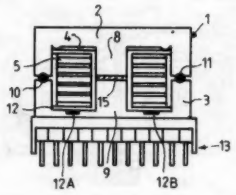
1. Apparatus for forming a series of magnetized zones on a magnetizable body comprising: a magnetizing conductor; an electric current pulse source for feeding electric current pulses through said magnetizing conductor to create a magnetic field; and at least one magnetic field dampening means having means spaced a predetermined distance from the magnetizing conductor and positioned so that the magnetic field created by the pulses fed through the magnetizing conductor is dampened adjacent said magnetic field dampening means whereby an electric current pulse fed through the magnetizing conductor creates a magnetic field which will penetrate that portion of the magnetizable body adjacent the magnetizing conductor with substantially no penetration of that portion of the magnetizable body adjacent the dampening means.

5,025,241

TRANSFORMER OF FERRITE CLOSED MAGNETIC CIRCUIT TYPE

Jean-Michel Bouillot, Arc les Gray; Thierry Coutureau, Dole, and Patrick G. Decuyper, Dijon, all of France, assignors to Orega Electronique et Mecanique, Courbevoie, France

Filed Feb. 16, 1990, Ser. No. 480,763
Claims priority, application France, Mar. 28, 1989, 89 03985
Int. Cl.[5] H01F *17/06, 27/26*
U.S. Cl. 336—100 3 Claims



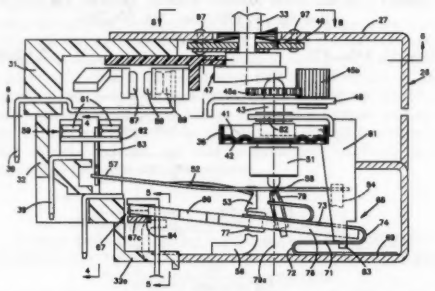
1. A transformer comprising a ferrite closed magnetic circuit including a gap in the circuit and a winding support carrying at least one electrically separated coil, wherein the gap is filled with with a single component mastic selected from the group consisting of polysulfides and polyurethanes.

5,025,242

OVEN THERMOSTAT

Calvin J. Holtkamp; George L. Hetrick, and Richard Warren, all of Mansfield, Ohio, assignors to Robertshaw Controls Company, Inc., Richmond, Va.

Filed Jul. 24, 1990, Ser. No. 558,324
Int. Cl.[5] H01H *37/36, 37/12*
U.S. Cl. 337—309 29 Claims



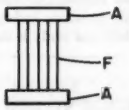
1. An oven control for self-cleaning ovens comprising a body, a hydraulic sensing unit having a wafer-like bellows mounted in said body, said bellows providing first and second opposed side walls movable apart in response to increased sensed temperature and toward each other in response to decreases in sensed temperature, an elongated control shaft mounted in said body for rotation about its axis, cam means mounted on said shaft operating to adjustably position said first wall of said bellows relative to said body, first switch connected for operation by said second side wall for controlling the temperature of an associated oven, said cam means operating to move said first side wall relative to said body to adjust the temperature of operation of said first switch within a range of temperatures, and a second switch operated by said second side wall in response to a substantially fixed predetermined temperature regardless of the position of said cam means.

5,025,243

INFRARED DETECTIVE ELEMENT

Hiroshi Ichikawa, Yokohama, Japan, assignor to Nippon Carbon Co., Ltd.; Sogo Security Services Co. and Hiroaki Yanagida, all of Tokyo, Japan

Filed Oct. 5, 1989, Ser. No. 417,477
Int. Cl.[5] H01L *31/08*
U.S. Cl. 338—18 2 Claims



1. An infrared detective element for detecting a dose of infrared rays by a change in electrical resistance of monofilaments composed mainly of silicon carbide upon infrared radiation thereto,

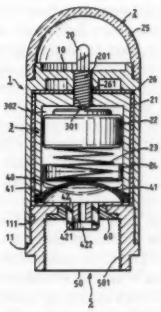
the monofilaments having a resistivity of 1.0×10^5 to 1.0×10^3 Ω.cm at room temperature and a diameter of 3 to 200 μm, the monofilaments being arranged between electrodes without bringing them into contact with each other.

5,025,244

TIRE PRESSURE INDICATOR

Tien-Tsai Huang, No. 4, Lane 30, Wu-Chang St., Pan-Chiao City, Taiwan

Continuation of Ser. No. 407,351, Sep. 14, 1989, Pat. No. 4,945,357. This application Jul. 27, 1990, Ser. No. 558,647
Int. Cl.[5] B60C *23/00*
U.S. Cl. 340—442 2 Claims



1. A tire pressure indicator having a hollow cylindrical body formed with a closed side at one end thereof and an open side at another end thereof for being positioned on a tire valve of an associated tire, comprising:

a pressure-indicating mechanism having a visible tire-deflated condition and a tire-inflated condition;

a sleeve member with a closed side located at a lower end thereof movably disposed in the hollow cylindrical body with a portion of said pressure-indicating mechanism being received therein;

a piston means movably disposed in an inner chamber of said pressure-indicating mechanism so as to be controlled by the tire pressure of an associated tire for operating said pressure-indicating mechanism to indicate the tire-deflated and tire-inflated conditions in conjunction with the tire pressure of the associated tire;

a pressure sensing means fixedly provided under said piston means for being detachably connected to the time valve of

the associated tire to monitor and indicate the pressure of the associated tire; and

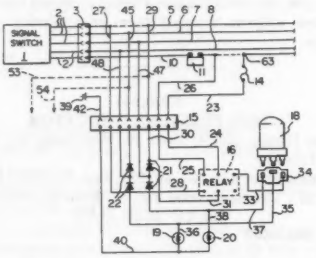
a supporting base, having an air chamber formed therein with internal and external threads provided therearound, screw-connected to the open side of the hollow cylindrical body for being detachably connected to the tire valve of the associated tire; whereby, with said tire pressure indicator being detachably connected to an associated tire, the pressure of the associated tire can be monitored and indicated via the pressure-indicating mechanism without incurring any air pressure leakage therefrom even when the hollow cylindrical body is damaged or loosened.

5,025,245

PEDESTRIAN SIGNAL SYSTEM FOR AUTOMOBILES

Otto Barke, 6423 - 14 Avenue, Edmonton, Alberta, Canada T6L 1Y1

Filed Jun. 26, 1989, Ser. No. 371,005
Claims priority, application Canada, Nov. 24, 1988, 584368
Int. Cl.[5] B60Q *1/26*
U.S. Cl. 340—471 **3 Claims**



1. An auxiliary signal system for automobiles of the type including a main signal system defined by front and rear, right and left stop and amber turn indicators, and a flasher for indicating an emergency, said auxiliary signal system comprising relay means for connection to the main signal system to supply power to the auxiliary system and to render the main signal system inoperative when the auxiliary system is operating, auxiliary flasher means for supplying power alternately to the left and right vehicle turn indicators when the relay means is activated; timer means connected to said relay means for controlling the duration of operation and automatic shut-off of the auxiliary system; control circuit means connected to and receiving power from said main signal system and from the vehicle brake system, said control circuit means incorporating said relay means and said timer means for controlling operation of said flasher means, whereby actuation of the vehicle brakes and of the control circuit means by a driver causes alternating flashing of the vehicle front and rear turn indicator lights which continues for a predetermined period of time after the brake pedal is released.

5,025,246

EAS TAG WITH MOTION DETECTION FACILITY

Howard M. Schenkel, Boca Raton, Fla., assignor to Sensormatic Electronics Corporation, Deerfield Beach, Fla.

Filed Apr. 10, 1990, Ser. No. 507,655
Int. Cl.[5] G08B *13/14*; H01H *35/02*
U.S. Cl. 340—572 **27 Claims**

1. In combination:

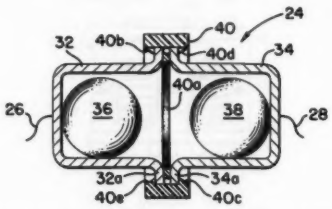
(a) an EAS tag inclusive of an electrical power source contained with said tag and circuitry powered by said electrical power source; and

(b) a motion sensor operatively associated with said tag and contained therewith, said motion sensor being connected electrically between said electrical power source and such tag circuitry, said motion sensor comprising

I. first and second housings comprised of electrically conductive material,

II. first and second electrically conductive means movably supported respectively in said first and second housings, and

III. joinder means for interconnection of said first and second housings, said joinder means being comprised of electrically insulative material and defining a passage permitting movement of said first and second electri-



cally conductive means between said first and second housings responsively to orientation of said tag,

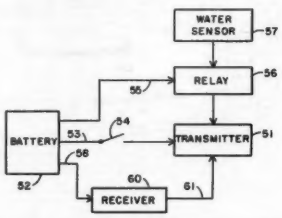
said joinder means, said first and second housings and said first and second electrically conductive means being collectively dimensioned to provide for electrical conductivity between said first and second housings upon reorientation of said tag from disposition wherein neither of said first and second electrically conductive means are in registry with said joinder means.

5,025,247

PORTABLE EMERGENCY ALERT SYSTEM

James C. Banks, 30924 Mission Avenue, Tavares, Fla. 32778

Filed Apr. 9, 1990, Ser. No. 506,293
Int. Cl.[5] G08B *13/00, 21/00*
U.S. Cl. 340—574 **5 Claims**



1. A portable emergency alarm system comprising:

a power source;

a digital receiver having a latch relay connected in circuit with said power source;

at least one of a sound alarm and light means connected in circuit with said latch relay;

a portable digital transmitter having a failsafe activating means for triggering said receiver means latch relay and thereby energizing said sound alarm and light means; and

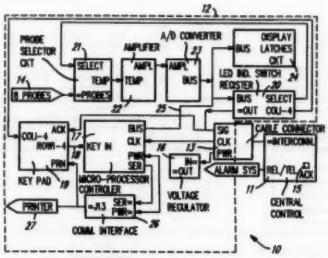
a water sensor attached to said portable digital transmitter to energize an alarm system whenever the transmitter is immersed in a body of water, said water sensor having a pair of dissimilar metal electrodes spaced by an insulator for generating a galvanic current for actuating said transmitter.

5,025,248

AUTOMATIC TEMPERATURE MONITORING SYSTEM

Réal Bergeron, Ste-Marthe-sur-le-Lac, Canada, assignor to Microthermo, Laval, Canada

Filed Sep. 1, 1989, Ser. No. 402,885
Int. Cl.[5] G08B 17/06; G01K 13/00; H02J 7/00
U.S. Cl. 340—596 16 Claims



1. An automatic temperature monitoring system comprising a central control circuit and one or more processing circuits connected in parallel to said central control circuit, each said processing circuit having one or more remote temperature sensing probes connected thereto, each said processing circuit having switch means operable by a user for programming microcontroller circuit of said processing circuit and for setting high and low temperature limit parameters as well as alarm time delay parameters for analyzing current signals generated by each said remote temperature sensing probe, display means for displaying numerical values of said temperature and limit parameters, access output means for accessing stored information signals in said microcontroller and representative of accumulated monitored signals received from said sensing probes on a predetermined periodic basis, alarm means for generating an alarm upon detection of an alarm condition by said microcontroller, said probes having current generating means for generating said current signals which are proportional to an ambient temperature sensed by said probes, and control means having memory means for controlling the operation of said processing circuit, said probes being connected to selection means of said processing circuit, converting means from converting said current signals of said probes to digital signals, said control means storing said digital signals in said memory means and being responsive to a program stored in said memory means, said switch means is a keypad having a plurality of switches for accessing programmed functions in said stored program, and said programmed functions being accessible through a source code.

5,025,249

PIXEL LOOKUP IN MULTIPLE VARIABLY-SIZED HARDWARE VIRTUAL COLORMAPS IN A COMPUTER VIDEO GRAPHICS SYSTEM

Larry D. Seiler, Boylston; James L. Pappas, Leominster, and Robert C. Rose, Hudson, all of Mass., assignors to Digital Equipment Corporation, Hudson, Mass.

Filed Jun. 13, 1988, Ser. No. 206,026
Int. Cl.[5] G09G 1/00
U.S. Cl. 340—721 11 Claims

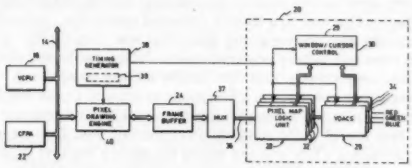
1. A computer video graphics system for displaying pixel values in one or more windows on a monitor, comprising:

a. a physical color lookup table for storing one or more virtual color lookup tables for producing digital color values to be displayed on the monitor;

b. a pixel value memory containing pixel values for indexing into one or more virtual color lookup tables;

c. means for providing a window number corresponding to each pixel value in the pixel value memory;

d. a base value lookup table having a base value for each window, said base value lookup table having means for allowing access to said base value lookup table by using said window numbers as indices into said base value lookup table; and



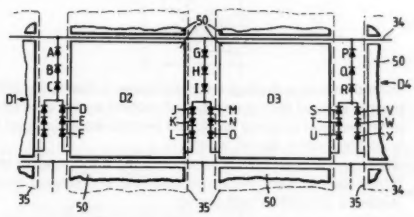
e. adders for adding pixel values to the base value from the base value lookup table thereby to produce indices into the physical color lookup table.

5,025,250

MATRIX DISPLAY DEVICE

Ralph N. Hains, Cardiff, United Kingdom, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 22, 1989, Ser. No. 327,224
Claims priority, application United Kingdom, Jun. 10, 1988, 8813778
Int. Cl.[5] G09G 3/00, 3/36
U.S. Cl. 340—811 20 Claims



1. A matrix display device comprising a plurality of row and column address conductors, a plurality of electro-optical display elements each of which is connected between a single row conductor and column conductor in series with a two terminal non-linear resistance device which comprises first and second parallel conduction branches capable of allowing current flow in respective opposite directions with each branch exhibiting a threshold characteristic and comprising a plurality of series-connected diode elements, characterized in that for each of a plurality of groups of display elements a part comprising at least one diode element of a second branch of a non-linear resistance device associated with a first display element is common to, and forms part of, a first branch of a non-linear device associated with a second display element, said second and first branches of said first and second display elements respectively each containing at least one further diode element between its associated display element and the common part.

5,025,251

SELF-TUNING DIRECT COUPLED DATA LIMITER OF A BATTERY SAVER TYPE PAGING RECEIVER

James G. Mittel, Boynton Beach, and Walter L. Davis, Coral Springs, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

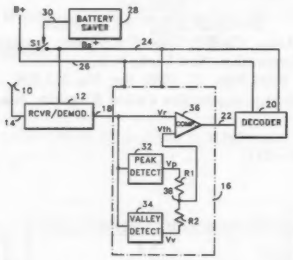
Filed Jun. 29, 1989, Ser. No. 373,299
Int. Cl.[5] H04Q 7/00; H04L 25/06; H04B 1/16
U.S. Cl. 340—825.44 9 Claims

1. A battery saver type paging receiver including: an input section for receiving a paging signal transmitted from an external source, said paging signal including modulated digitally coded data words, and for demodulating said received paging signal to recover an analog signal representing the digitally

coded data words; a data limiter section for converting the recovered analog signal into a corresponding binary bit stream representing the coded data words of said paging signal; and a battery saver section coupled to said input section and said data limiter section and to a battery powered source for cyclically energizing and de-energizing said input and data limiter sections from said battery powered source during awake and sleep periods, respectively, said data limiter section comprising:

first means operative in a first mode to acquire a peak amplitude from the recovered analog signal and to generate a first digital word representative thereof, said first means including a first storage means for storing the first digital word, said first means operative in a second mode to cause said first storage means to hold the first digital word;

second means operative in said first mode to acquire a valley amplitude from the recovered analog signal and to generate a second digital word representative thereof, said



second means including a second storage means for storing the second digital word, said second means operative in said second mode to cause said second storage means to hold the second digital word;

said first and second means being each further operative in a third mode to alter the respective first and second word thereof a predetermined count;

control means responsive to at least one command signal to control the transfer of operation of said first and second means among the first, second and third modes;

third means for converting the recovered analog signal into its corresponding binary bit stream based on said first and second digital words; and

means for generating a reference signal wherein the control means is governed by the reference clock signal in controlling the transfer among the modes of the first and second means.

5,025,252

PAGING RECEIVER WITH OVER-THE-AIR CHARACTERIZATION OF CALL SIGNAL PROCESSING

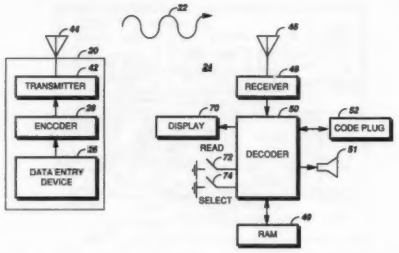
Michael J. DeLuca; Gregory O. Snowden, both of Boca Raton, and Robert D. Fennell, Coral Springs, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 3, 1989, Ser. No. 431,112
Int. Cl.[5] H04B 7/00
U.S. Cl. 340—825.44 **23 Claims**

1. A paging receiver being assigned at least one call address code for receiving and accepting a call signal, transmitted from an external source and including a call address code substantially consistent with said at least one assigned call address code of said receiver, said accepted call signal having a protocol capable of including message information associated with said at least one assigned call address code and a characterization code corresponding to said at least one assigned call address code, said paging receiver including a display; means responsive to a display command to display selected message information on said display; and means governed by the characterization code of said accepted call signal to disable said at least one assigned call address code such that received message information of said disabled at least one assigned call address code is prevented from being displayed on said display by said display means; said paging receiver comprising:

first means for decoding and examining said accepted call signal to identify the presence of and obtain message information associated with the call address code thereof;

means for storing said obtained message information of said accepted call signal;



second means for decoding and examining said accepted call signal to identify the presence of and obtain the characterization code thereof corresponding to said at least one assigned call address code; and

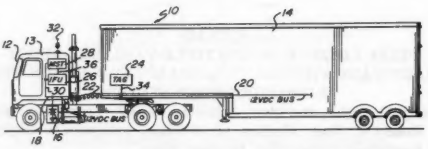
means governed by said obtained characterization code to selectively enable and disable the storage of obtained message information corresponding to said disabled at least one assigned call address code by said storing means.

5,025,253

SYSTEM AND METHOD FOR REMOTELY MONITORING THE CONNECT/DISCONNECT STATUS OF A MULTIPLE PART VEHICLE

Joseph V. DiLullo, Rydal; Stephan C. Schifter, Philadelphia, both of Pa.; Michael Negin, Pennsauken, N.J., and Kenneth W. Paist, Philadelphia, Pa., assignors to Secura Corporation, Philadelphia, Pa.

Continuation of Ser. No. 258,162, Oct. 14, 1988, Pat. No. 4,897,642. This application Oct. 3, 1989, Ser. No. 416,387
Int. Cl.[5] H04B 1/00; G08B 5/22
U.S. Cl. 340—825.06 **43 Claims**



1. Status monitoring apparatus for a vehicle having a first part and at least one second part comprising:

(a) tag means for placement on the second part of the vehicle, the tag providing a unique ID code;

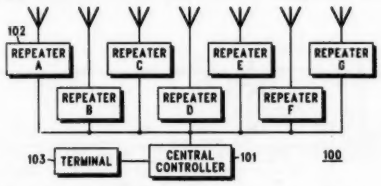
(b) processing means for placement on the first part of the vehicle for detecting the presence of a valid ID code from the tag means and or providing a status indication that the second part has been connected to the first part when a valid ID code is detected and that the second part has been disconnected from the first part when a valid ID code has not been detected; and,

(c) transmitting means for placement on the first part of the vehicle for transmitting at least the status indication to a remote location.

5,025,254
COMMUNICATION SYSTEM WITH IMPROVED RESOURCE ASSIGNMENT

David W. Hess, Hoffman Estates, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 23, 1989, Ser. No. 370,497
Int. Cl.[5] H04Q *7/00*
U.S. Cl. 340—826 **4 Claims**



1. In a communication system having a resource controller for controlling allocation of a plurality of communication resources amongst a plurality of communication units, an improvement wherein:

(A) some, but not all, of the communication units are combined to form a first group;

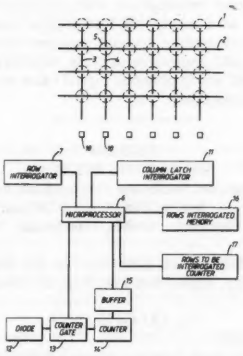
(B) some, but not all, of the communication resources are continually dedicated for use only by the first group;

such that the resource controller can select from any available communication resource to support a communication between communication units belonging to the first group, but can only select from available non-dedicated communication resources to support a communication between communication units that do not belong to the first group.

5,025,255
SECURE KEYBOARD WITH RANDOM ORDER OF KEY INTERROGATION

David Mould, Turners Hill, United Kingdom, assignor to H. Bollmann Manufacturers Limited, West Sussex, England

Filed Sep. 14, 1989, Ser. No. 407,315
Claims priority, application United Kingdom, Sep. 22, 1988, 8822296
Int. Cl.[5] H03K *17/94*; H03M *11/20*
U.S. Cl. 341—26 **15 Claims**

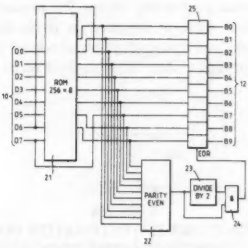


1. A keyboard arrangement comprising a plurality of keys arranged in rows and columns, said rows of keys being associated with a respective first set of conductors and said columns of keys being associated with a respective second set of conductors, each key acting, on depression thereof, to interconnect respective ones of said first and second sets of conductors associated with the row and column in which the key is located; means for interrogating said rows during each of a plurality of cycles of operation by transmitting pulses to said rows to determine the presence of a transmitted pulses on any one of said columns, the interrogating means being adapted to interrogate said rows and columns in a random or quasi-random order during successive cycles of operation.

5,025,256
DATA TRANSMISSION CODE

Reginald W. Stevens, Stockport, Great Britain, assignor to International Computers Limited, London, England

Filed Apr. 17, 1990, Ser. No. 510,051
Claims priority, application United Kingdom, May 31, 1989, 8912471
Int. Cl.[5] H03M *7/00*
U.S. Cl. 341—59 **9 Claims**



1. A method of encoding data comprising:

(I) forming a set of 10-bit code blocks satisfying the following rules:

(a) each code block in the set contains either 5 bits of a first prdetermined binary value and 5 bits of a second predetermined binary value, or 4 bits of the first binary value, and 6 bits of the second binary value,

(b) no code block in the set has more than 4 contiguous bits of the first binary value of more than 4 contiguous bits of the second binary value,

(c) each code block in the set has at least one transition in the first three bits of the code block and at least one transition in the last three bits of the code block,

(d) each code block in the set contains at least four transitions, and

(e) each code block in the set contains at least two transitions in the first six bits of the code block and at least two transitions in the last six bits of the code block,

(II) receiving input 8-bit data bytes; and

(III) encoding each 8-bit data byte as one of said set of 10-bit code blocks.

5,025,257
INCREASED PERFORMANCE OF DIGITAL INTEGRATED CIRCUITS BY PROCESSING WITH MULTIPLE-BIT-WIDTH DIGITS

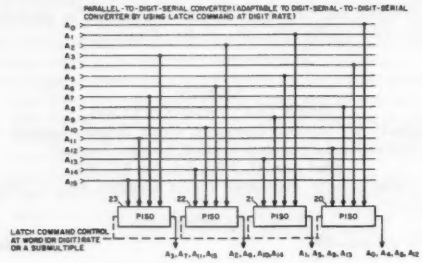
Richard I. Hartley, Schenectady, N.Y.; Peter F. Corbett, Princeton, N.J.; Fathy F. Yassa, and Sharbel E. Noujaim, both of Clifton Park, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 347,860, May 4, 1989, Pat. No. 4,942,396, which is a continuation-in-part of Ser. No. 204,792, Jun. 10, 1988, as ordered. This application Feb. 20, 1990, Ser. No. 482,122
Int. Cl.[5] H03M *9/00*
U.S. Cl. 341—101 **46 Claims**

1. A system for processing digital data, said system comprising:

first to-digit-serial converter means for converting to an m-bit-digit digit-serial format first input digital data re-

ceived in another digital format, m being a positive plural integer at least three; and


PARALLEL-TO-DIGIT-SERIAL CONVERTER (ADAPTIBLE TO DIGIT-SERIAL-TO-DIGIT-SERIAL CONVERTER BY USING LATCH COMMAND AT DIGIT RATE)
PISO
PISO
PISO
PISO
LATCH COMMAND CONTROL AT WORD OR DIGIT RATE OR A SUBMULTIPLE

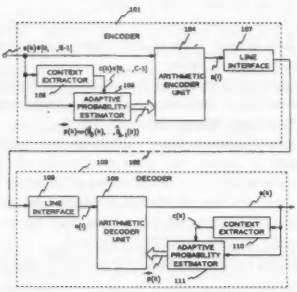
first digit-serial processing means for processing said first input digital data, as supplied in m-bit-digit digit-serial format from said first to-digit-serial converter, to generate first output digital data in m-bit-digit-serial format.

5,025,258

ADAPTIVE PROBABILITY ESTIMATOR FOR ENTROPY ENCODING/DECODING

Donald L. Duttweiler, Rumson, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 1, 1989, Ser. No. 359,559
Int. Cl.[5] H03M *7/00*
U.S. Cl. 341—107 **27 Claims**



1. An adaptive probability estimator for generating probability estimates of a supplied signal having a plurality of symbol values in a supplied context to be used in entropy encoding/decoding, comprising:

a source of the supplied signal;

means for obtaining representations of accumulated occurrences of individual symbol values of said supplied signal in said supplied context; and

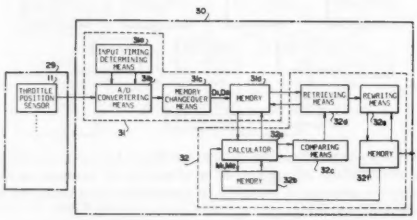
means responsive to said representations of accumulated occurrences for adjusting a rate of adaptation of the adaptive probability estimator in accordance with a prescribed criterion, said means for adjusting including means for obtaining at least a first prescribed characteristic of said representations of accumulated occurrences and means responsive to said first prescribed characteristic for proportionately adjusting said representations of accumulated occurrences when said first prescribed characteristic meets said prescribed criterion.

5,025,259

ANALOG-TO-DIGITAL CONVERSION SYSTEM FOR AN ELECTRONIC CONTROL SYSTEM OF A MOTOR VEHICLE

Kunihiro Abe, Higashimurayama, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 9, 1990, Ser. No. 462,585
Claims priority, application Japan, Jan. 19, 1989, 1-010679
Int. Cl.[5] H03M *1/06*
U.S. Cl. 341—118 **5 Claims**



1. An analog-to-digital conversion system for obtaining digital values for an electronic control system of a motor vehicle having various sensors to detect operating conditions of said motor vehicle and to produce analog signals comprising:

input determining means for generating a select signal to select one of a plurality of channels corresponding to one of said sensors and operating conditions;

converting means responsive to said analog signals and said select signal for converting the analog signal corresponding to said one sensor and operating condition into digital signals at a predetermined timing;

changeover means responsive to said digital signals for storing said digital signals as digital values art respective addresses;

calculating means responsive to said digital values for calculating a difference between a present said digital value at a present time and an old digital value obtained at a previous time and for producing a difference signal;

comparing means responsive to said difference signal for effectively comparing said present digital value with said old digital value in order to select a smallest difference value and for producing a corresponding signal; and

retrieving means responsive to said corresponding signal for retrieving as a newly obtained digital value the digital value corresponding to said smallest difference value stored in said respective address, whereby influence of noise in said newly obtained digital value have been eliminated without delay.

5,025,260

MEASURING SYSTEM

Alexander Colquhoun, Heilbronn-Frankenbach, and Klaus Berchtold, Heilbronn, both of Fed. Rep. of Germany, assignors to Telefunken Electronic GmbH, Heilbronn, Fed. Rep. of Germany

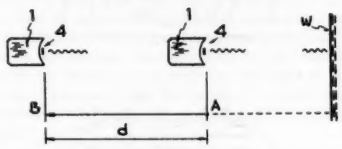
Filed Jun. 20, 1989, Ser. No. 368,544
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1988, 3821216
Int. Cl.[5] G01S *13/08*
U.S. Cl. 342—127 **23 Claims**

1. A measuring system for measuring a distance between first and second points, comprising:

a transmission and reception section having transmitting, receiving and detecting means for transmitting a first signal with a predetermined transmission frequency so as to be reflected off of a fixed object during a movement of the transmission and reception section from a first point to a second point, and concurrently with the transmission of

the first signal, receiving and detecting a frequency of the reflected signal;

means, responsive to the reflected signal received by said transmitting, receiving and detecting means, for producing a second signal having a frequency which is based on a difference between the predetermined frequency and the detected frequency of the reflected signal, the difference resulting from a Doppler effect on the detected frequency of the reflected signal caused by the movement of the transmission and reception section; and



an evaluation unit including

means for counting a total number of periods of the second signal from a time when the transmission and reception section leaves the first point until a time when the transmission and reception section arrives at the second point, and

means for calculating the distance based on the counted total number.

5,025,261

MOBILE OBJECT NAVIGATION SYSTEM

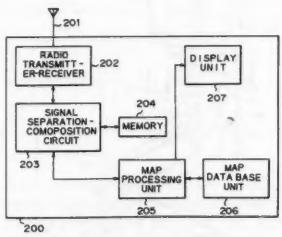
Tomozo Ohta, Ikoma; Hiroshi Nakano, and Masao Miyazaki, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 16, 1990, Ser. No. 464,141

Claims priority, application Japan, Jan. 18, 1989, 1-10837; Feb. 6, 1989, 1-26875

Int. Cl.[5] H04B *7/185*; G01S *5/02*

U.S. Cl. 342—357 **8 Claims**



1. A mobile navigation system using a communication system between at least one mobile object and a key station, comprising:

means, mounted on the mobile object, for determining the position of the mobile object;

means, mounted on the mobile object, for transmitting data representative of the determined position to the key station via the communication system;

a data base unit, mounted in the key station, for storing map data;

means, mounted in the key station, responsive to the transmitted position data for deriving from the data base unit map data of an area that includes the position of the mobile object;

means, mounted in the key station, for transmitting data including the derived map data to the mobile object via the communication system; and

means, mounted on the mobile object, for displaying a composite image composed of the position data of the mobile object and the map data, in response to the transmitted data from the key station.

5,025,262

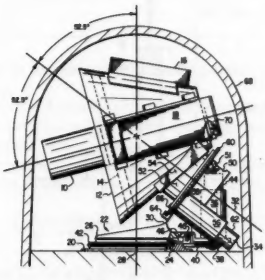
AIRBORNE ANTENNA AND A SYSTEM FOR MECHANICALLY STEERING AN AIRBORNE ANTENNA

Mohamed A. Abdelrazik, Rockwall; John D. Martin, and Boyd L. Corcoran, both of Greenville, all of Tex., assignors to E-Systems, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 927,387, Nov. 6, 1986, abandoned. This application Jun. 15, 1987, Ser. No. 61,494

Int. Cl.[5] H01Q *3/08*

U.S. Cl. 343—705 **17 Claims**



1. An antenna/pedestal assembly for an airborne communication system, comprising:

an antenna having a longitudinal axis and including a radiating element positionable with reference to an azimuth axis and an elevation axis;

a pedestal including a pedestal base, an azimuth member having a longitudinal axis coinciding with the azimuth axis of the system, means to couple the azimuth member to the pedestal base to permit rotation of said azimuth member, azimuth steering unit to rotate the azimuth member with reference to the pedestal base, elevation member integral with the azimuth member and having longitudinal axis non-orthogonal to and intersecting the azimuth axis, interface means to couple said antenna to the elevation member of said pedestal with the longitudinal axis of the antenna non-orthogonal to and intersecting the longitudinal axis of the elevation member to permit rotation of said antenna with reference to the elevation member such that in at least one position of the antenna the longitudinal axis thereof coincides with the azimuth axis, elevation steering unit to rotate the interface means and the antenna with reference to the elevation member; and

antenna control unit, coupled to the azimuth steering unit and the elevation steering unit, to generate steering control signals in response to antenna position signals, RF signals received by said antenna and navigational and altitude information signals.

5,025,263

MULTI-FREQUENCY ANTENNA

Kengo Okamoto; Takaaki Habu, and Shoji Murol, all of Saitama, Japan, assignors to Nippon Antenna Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 285,852, Dec. 16, 1988, abandoned. This application Dec. 19, 1989, Ser. No. 453,399

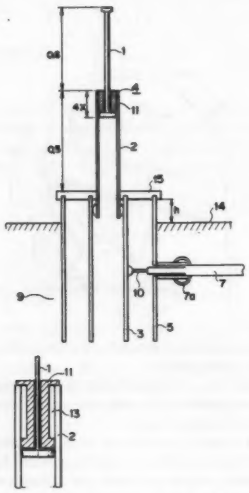
Claims priority, application Japan, Dec. 25, 1987, 62-329369

Int. Cl.[5] H01Q *1/100, 1/320, 9/000*

U.S. Cl. 343—715 **4 Claims**

1. In a multi-frequency antenna which includes: a first rod; a second rod movably supported on said first rod by a phase shifter for extending and contracting movements relative to said first rod; a hollow third rod on which said first rod is

movably supported and which is capable of accepting and storing said first and second rods therein; and outer pipe disposed around and immovably supporting said third rod, said outer pipe being supported by a car body so that a predetermined lengthwise portion of said outer pipe is disposed under the car body and is grounded at a predetermined position; a power feeding coaxial cable having a core connected to said third rod and having an outer skin ground connected to said outer pipe; antenna driving means for extending and contracting said second rod relative to said first rod and said first rod relative to said third rod and outer pipe; and impedance matching means which includes said third rod, said coaxial cable and said outer pipe being configured to form a coaxial line arrangement of an open trap type so that an input impedance of the outer pipe is continuous; the improvement comprising wherein said phase shifter is a dielectric element which is approximately $\lambda/4$ long electrically, is inserted in a portion of said first rod, and has second rod extending through an opening therein, and means defining between said first rod and said dielectric element an air gap having a selected size which effects a predetermined dielectric constant in the phase shifter, wherein the antenna gain and phase are dependent on said dielectric constant.



5,025,264

CIRCULARLY POLARIZED ANTENNA WITH RESONANT APERTURE IN GROUND PLANE AND PROBE FEED

Gary P. Stafford, St. Albans, England, assignor to The Marconi Company Limited, England

Filed Feb. 21, 1990, Ser. No. 482,525

Claims priority, application United Kingdom, Feb. 24, 1989, 8904303

Int. Cl.[5] **H01Q** *1/38, 13/08, 13/18*

U.S. Cl. 343—767 **14 Claims**

10. An antenna element for circularly polarized signals, comprising:

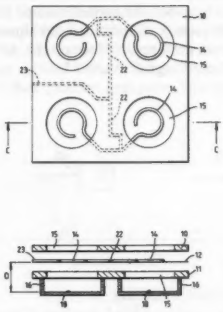
(a) a probe lying in a probe plane;

(b) an axis normal to said probe plane;

(c) a feed conductor lying in said probe plane and connected to said probe;

and (d) a ground plane spaced from, but parallel to, said probe plane;

(e) said ground plane having a resonant aperture;



(f) said probe substantially surrounding said axis and lying within a boundary formed by a projection of said resonant aperture.

5,025,265

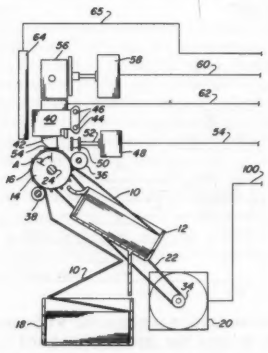
METHOD AND APPARATUS FOR INCREASING VISIBILITY OF TREND LINES ON STRIP CHART RECORDERS

Daniel J. Carr, Harleysville, and Charles R. Scally, Warminster, both of Pa., assignors to General Signal Corporation, Stamford, Conn.

Filed Dec. 21, 1988, Ser. No. 288,322

Int. Cl.[5] **G01D** *9/00*

U.S. Cl. 346—1.1 **9 Claims**



5. A method for providing good visibility for the most recent record on a multipoint strip chart recorder of the type which periodically scans measured variables to be recorded and causes a printing mechanism to record the values of those variables as it traverses a chart being fed over a paper drive roll from a paper supply system to a paper collection system in a manner such that the lengthwise dimension of the chart represents time, comprising the steps of:

operating said printing mechanism so it traverses the chart on the top portion of the feed drive roll to record on the chart the values of measured variables which have been scanned since the previous printing of the values, said printing being such that the position of the record along the chart width is indicative of the value of the variable being recorded;

dividing the operating time of the recorder into cycles of

duration depending on the time scale desired along the length of the chart so that each cycle has a fixed printing period sufficient for operation of the printing mechanism to print a record of the variables and a rest period of duration sufficient for viewing of the record;

advancing the feed drive roll at the end of each printing period to advance the chart to a rest position which is forward of the printing position, the advance of the drive roll being by an angle sufficient to make the most recent record on the chart more easily visible from a normal viewing position; and

retracting said chart from said rest position at the end of said rest period by driving the feed roll in reverse to a position which is forward of the previous printing position on the chart by an amount corresponding to that required to maintain the selected time scale for the chart so that the position of a record along the length of the chart is always indicative of the time the corresponding variable was scanned.

5,025,266

PHOTOSENSITIVE AND HEAT-SENSITIVE POLYMERS, PROCESS FOR PRODUCING THE SAME AND PROCESS FOR RECORDING INFORMATION USING THE SAME

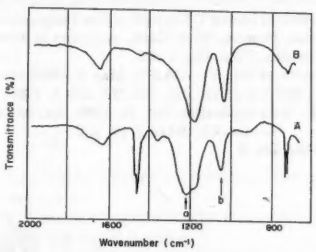
Yasuki Shimamura, Fuji, and Jyoji Ihata, Mishima, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 171,590, Mar. 22, 1988, Pat. No. 4,965,322. This application Jul. 20, 1990, Ser. No. 554,751

Claims priority, application Japan, Apr. 6, 1987, 62-83071; Apr. 16, 1987, 62-91964; Apr. 20, 1987, 62-95055; May 18, 1987, 62-118865; Jun. 1, 1987, 62-134934; Jun. 12, 1987, 62-145235; Jul. 10, 1987, 62-171074; Jul. 15, 1987, 62-174899

Int. Cl.[5] G01D *9/00, 15/10;* **B41M** *5/00*

U.S. Cl. 346—1.1 **7 Claims**



1. A process for recording information which comprises contacting a thermal head with a photosensitive and heat-sensitive polymer having conjugated polyenes and sulfonic acid groups and an absorbance ratio of a strong band in a region of 1200 cm^{-1} to 1300 cm^{-1} assignable to sulfonic acid groups adjacent to conjugated polyenes of at least 3 sequence lengths to a strong band near 1050 cm^{-1} assignable to sulfonic acid groups in a IR spectrum of at least 0.6.

5,025,267

THERMAL PRINT HEAD TERMPERATURE CONTROL

Harold D. Schofield, Naragansett, and Paul R. Caron, Tiverton, both of R.I., assignors to DataCard Corporation, Minnetonka, Minn.

Filed Sep. 23, 1988, Ser. No. 248,829

Int. Cl.[5] G01D *9/00, 15/10*

U.S. Cl. 346—1.1 **12 Claims**

1. Apparatus for thermal printing of graphics images, comprising:

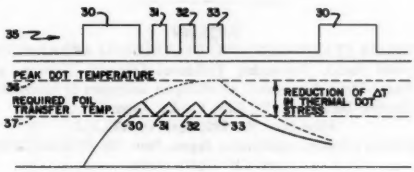
a thermal printhead comprised of a plurality of dot elements;

means for controlling the temperature of said dot elements and said thermal printhead, thereby optimizing print quality and reducing the thermal and electrical stress on said thermal printhead; and

wherein the temperature controlling means further includes:

hysteresis control means for determining an amount of electrical pulses supplied to said each of said dot elements in said thermal printhead;

peak temperature control means for determining the width



of said pulses supplied to said dot elements in said thermal printhead;

pre-heating control means for raising the temperature of said dot elements when said dot elements have been idle for a predetermined period; and

substrate temperature control means for maintaining the temperature of said thermal printhead at a predetermined value.

5,025,268

OPTICAL SCANNING APPARATUS AND ASYMMETRICAL ASPHERIC SCANNING LENS

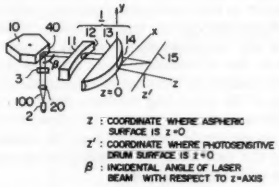
Akira Arimoto, Kodaira; Susumu Saito, Hachioji; Yoshito Tsunoda, Tokyo; Shigeo Moriyama, Tama, and Takeshi Mochizuki, Mito, all of Japan, assignors to Hitachi, Ltd. and Hitachi Koki Co., Ltd., both of Tokyo, Japan

Filed Jul. 10, 1989, Ser. No. 377,325

Claims priority, application Japan, Jul. 13, 1988, 63-172724

Int. Cl.[5] H04N *1/21*

U.S. Cl. 346—108 **14 Claims**



1. An optical scanning apparatus comprising:

a light source for emitting optical beams;

a rotating polygonal mirror for deflecting said optical beams so that the beams scan a scanning surface;

a scanning lens with an optical axis disposed between said rotating polygonal mirror and said scanning surface for imaging said rotating polygonal mirror and said scanning surface in a conjugate relationship with respect to a sub-scanning direction (y) which is perpendicular to a main scanning direction (x) to be scanned by said rotating polygonal mirror and for imaging said optical beams which have been deflected at the reflective surface of said rotating polygonal mirror at a position on said scanning surface in proportion to its scanning angle, said scanning lens having an aspheric surface having individual curvature radii in the main scanning direction and the sub-scanning direction, wherein the curvature radius in the sub-scanning direction is increased asymmetrically with respect to the optical axis with the distance between the curvature radius in the sub-scanning direction and the optical axis; and

an optical system disposed between said light source and

said rotating polygonal mirror for converging said optical beams emitted from said light source with respect to said sub-scanning direction and making said optical beams diagonally incident upon, with respect to said optical axis of said scanning lens, said reflective surface of said rotating polygonal mirror to form an elongated shape in said main scanning direction, said optical scanning making said optical beams obliquely incident upon, with respect to said optical axis of said scanning lens.

5,025,269

COLOR ELECTROSTATIC RECORDING APPARATUS

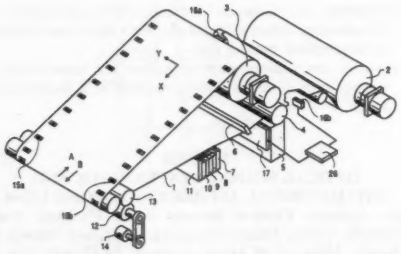
Kiyoshi Saeki, Toyonaka; Toshinori Ohtsuki, Yawata, and Kazuo Ueno, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 8, 1989, Ser. No. 433,212

Claims priority, application Japan, Nov. 10, 1988, 63-284520

Int. Cl.[5] G01D *15/06*

U.S. Cl. 346—108 **1 Claim**



1. A color electrostatic recording apparatus comprising: transfer means for feeding a recording medium; recording means including a multi-pin electrode recording head and a plurality of developing devices provided along a transfer path of the recording medium for overlapping recording different color images in sequence onto the recording medium transferred by said transfer means; mark detecting means for provided adjacent to said multi-pin electrode recording head for detection of series of register marks arranged along at least one side edge of the recording medium; and compensation means responsive to the information given by said mark detecting means for estimating the amount of expansion/contraction and meandering of the recording medium, the former being measured at right angles to its transfer direction, and for actuating said multi-pin electrode recording head to expand or contract and shifting the recording start position of an image signal in accordance with the estimation.

5,025,270

RECORDING APPARATUS COUPLED INK SUPPLY TUBES

Kazuhisa Umezawa, Tokyo, Japan, assignor to Seiko Instruments, Inc., Chiba, Japan

Filed Jun. 22, 1989, Ser. No. 369,708

Claims priority, application Japan, Jun. 27, 1988, 63-85404[U]; Jul. 1, 1988, 63-88335[U]; Jul. 1, 1988, 63-88336[U]

Int. Cl.[5] G01D *15/18*

U.S. Cl. 346—140 R **9 Claims**

1. An ink jet recording apparatus comprising:

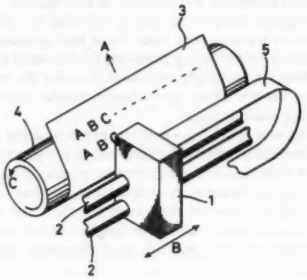
a recording head block having a plurality of ink jet heads for spraying ink drops;

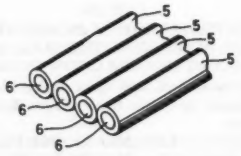
head moving means for moving said recording head block reciprocally;

paper feeding means for feeding paper sheet in a direction perpendicular to the moving direction of said head block;

an ink supplying source for storing an ink, said source being stationary relative to said recording head block; and

a plurality of flexible ink supplying tubes connected between said ink jet heads and said ink supplying source for causing said ink to flow in parallel through said ink supplying tubes in a given direction from said ink supplying source





to said ink jet heads, said tubes being bound together in a plane and arranged to be parallel to the movement direction of said recording head block.

5,025,271

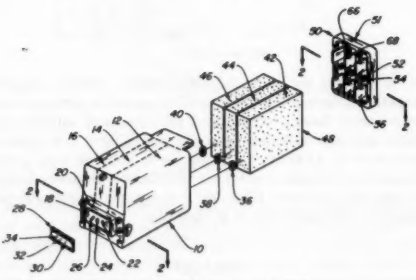
THIN FILM RESISTOR TYPE THERMAL INK PEN USING A FORM STORAGE INK SUPPLY

Jeffrey P. Baker; Duong T. La, both of San Diego, and Randy A. Coverstone, Newark, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 191,292, May 6, 1988, abandoned, which is a division of Ser. No. 880,774, Jul. 1, 1986, Pat. No. 4,771,295. This application Sep. 18, 1989, Ser. No. 409,486

Int. Cl.[5] B41J *2/05, 2/21*

U.S. Cl. 346—140 R **3 Claims**



1. An ink jet pen including, in combination:

a. a housing and support member having a support surface at one end thereof with openings for passing ink therethrough,

b. a thin film resistor type thermal ink jet printhead mounted on said support surface and having a plurality of ink ejection orifices communicating with said openings in said support surface,

c. a porous foam material mounted within said housing and said support member and operative to receive and retain a supply of ink for feeding ink through said openings in said

support surface and to said ink jet printhead, with said printhead receiving ink directly from said openings in said support surface and operative to eject ink in a direction normal to said support surface, said foam material being compressible to reduce its thickness and pore size while increasing its density, and the desired capillarity of said foam may be controlled and the capillary force of the foam increased to thereby render said foam material especially well suited for feeding ink to a thin film resistor type of thermal ink jet printhead, and

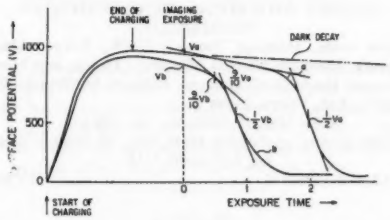
d. tab means extending into contact with said foam material for providing a desired amount of compressive force to said foam.

5,025,272

DOT EXPOSURE TYPE IMAGE FORMING APPARATUS

Satoshi Haneda, and Hiroyuki Nomori, both of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Dec. 26, 1989, Ser. No. 456,364
Claims priority, application Japan, Dec. 28, 1988, 63-330865
Int. Cl.[5] G01D *15/06*
U.S. Cl. 346—153.1 **20 Claims**



1. An apparatus for forming a toner image by reversal development, comprising:

a charging means for uniformly charging a photoreceptor to a given electrostatic potential;

said photoreceptor discharging in response to an exposure light to form an electrostatic latent image, said photoreceptor having a predetermined light decay curve indicating a relation between an amount of the exposure light and a discharged potential on the exposed portion wherein an absolute value of the differential coefficient of the light decay curve is small when the amount of the exposure light is small and said value sharply becomes large when the amount of the exposure light increases;

an exposure means for exposing said photoreceptor with a dot-shaped light; and

a developing means for providing toner onto said exposed portion of said latent image, thereby forming a toner image,

wherein said light decay curve satisfies the relationship

$$1 < E_{\frac{1}{4}}/E_{9/10}$$

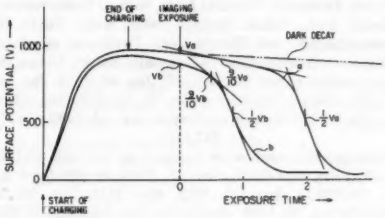
$E_{9/10}$ being a light sensitivity of said photoreceptor when said electrostatic potential has decayed to 9/10 of that at the start of said exposure and $E_{\frac{1}{4}}$ is a light sensitivity of said photoreceptor when said electrostatic potential has decayed to $\frac{1}{4}$ of that at the start of said exposure.

5,025,273

RF DRIVE CIRCUIT FOR AN ION PROJECTION PRINTING HEAD

John H. Bowers, Clarksburg, N.J., assignor to Armstrong World Industries Inc., Lancaster, Pa.

Filed Apr. 30, 1990, Ser. No. 516,647
Int. Cl.[5] G01D *15/06*
U.S. Cl. 346—159 **18 Claims**



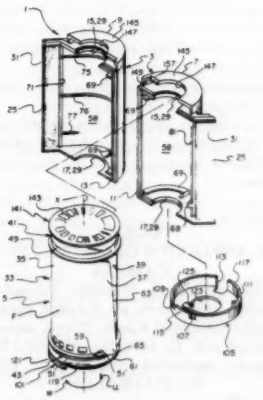
1. A circuit for generating a radio frequency (RF) AC voltage of sufficient peak-to-peak amplitude to produce a plasma when applied to RF lines, which present an effective capacitance, of an ion projection printing head, said circuit comprising means including an active switching device for providing current pulses through said device at a repetition rate related to said radio frequency, an inductor connected in series with said device and said effective capacitance, said inductor and effective capacitance defining a series resonance circuit resonant at said RF frequency, and said current pulse producing means including means for providing said current pulses at sufficient amplitudes to develop said sufficient peak-to-peak amplitude across said effective capacitance.

5,025,274

FILM CASSETTE WITH BUILT-IN SUPPORT FOR OPTICAL SENSOR TO READ FILM INFORMATION

Daniel M. Pagano, Henrietta, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 2, 1990, Ser. No. 562,501
Int. Cl.[5] G03B *7/00*
U.S. Cl. 354—21 **8 Claims**



1. A film cassette comprising a lighttight cassette shell for containing a filmstrip, and a film information disk supported for rotation relative to said shell, is characterized in that:

said film information disk includes optically readable information; and

sensor positioning means fixed to said shell includes a viewing aperture located a predetermined distance from the optically readable information of said film information disk to position an optoelectronic sensor at said viewing aperture to substantially optimally read the optically readable information as the disk is rotated.

5,025,275

PHOTOGRAPHIC CAMERA

Nobuyuki Taniguchi; Yoshiaki Hata, both of Nishinomiya; Yoshinobu Kudo, Sakai; Manabu Inoue, Kobe; Takeo Hoda, Kawachinagano, and Hiroshi Ueda, Toyokawa, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

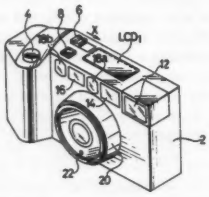
Continuation of Ser. No. 207,330, Jun. 16, 1988, Pat. No. 4,943,825, which is a division of Ser. No. 895,826, Aug. 12, 1986, Pat. No. 4,780,735. This application Jun. 13, 1990, Ser. No. 537,116

Claims priority, application Japan, Aug. 29, 1985, 60-190520; Aug. 29, 1985, 60-190521; Aug. 29, 1985, 60-190522; Aug. 29, 1985, 60-190523; Aug. 30, 1985, 60-192621; Sep. 10, 1985, 60-201095; Sep. 10, 1985, 60-201096; Nov. 14, 1985, 60-255550; Dec. 19, 1985, 60-286732

The portion of the term of this patent subsequent to Oct. 25, 2005, has been disclaimed.

Int. Cl.[5] G03B *17/24*

U.S. Cl. 354—106 **2 Claims**



1. A photographic camera having a photographic lens, comprising:

means for selecting a real focal length photographing mode in which a normal range in a frame of a film will be printed on a photographic paper and a pseudo focal length photographing mode in which a range smaller than the normal range in a frame of the film will be printed on a photographic paper;

means for specifying a magnification corresponding to a range to be printed on the photographic paper in printing when the pseudo focal length photographing mode is selected;

means for producing a signal indicative of a characteristic of a film loaded in the camera; and

means for limiting the magnification capable of being specified by the magnification specifying means below a predetermined value depending upon the signal from said producing means.

5,025,276

CONTROL APPARATUS OF SINGLE-LENS REFLEX CAMERA

Toshiyuki Kitazawa, Tokyo; Masahiko Kurosaki, Kanagawa, and Yutaka Ohsawa, Tokyo, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 10, 1990, Ser. No. 565,153

Claims priority, application Japan, Aug. 22, 1989, 1-215466

Int. Cl.[5] G03B *19/12*

U.S. Cl. 354—152 **23 Claims**

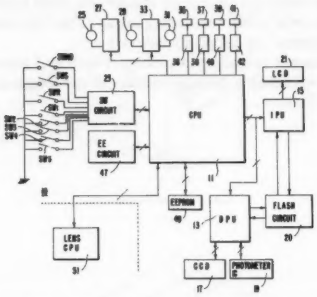
1. A control apparatus of a single-lens reflex camera, comprising:

a mirror which moves between a charge completion position and a photographing position;

a mirror driving means for moving the mirror between the charge completion position and the photographing position;

a mirror holding means for maintaining the mirror at the charge completion position;

a mirror charge detecting means for detecting the completion of the mirror charge;



a mode setting means for setting a continuous photographing mode; and,

a control means for releasing the hold of the mirror by the mirror holding means when the mirror charge detecting means detects the charge completion position of the mirror, at the continuous photographing mode.

5,025,277

CAMERA WITH FOCAL POINT SWITCHING MECHANISM

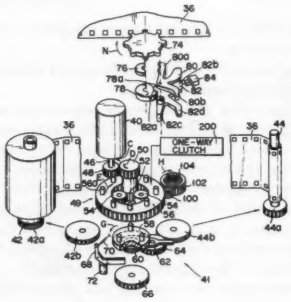
Takashi Inoue, Hachioji; Tatsuya Suzuki, Tokyo; Akiteru Kimura, Hachioji; Hiroaki Miyazaki, Tsukui, and Moriya Katagiri, Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 15, 1990, Ser. No. 494,128

Claims priority, application Japan, Mar. 28, 1989, 1-76048

Int. Cl.[5] G03B *1/18*

U.S. Cl. 354—173.1 **7 Claims**



1. A camera comprising:

a motor;

a planet gear mechanism having a planet gear to be revolved or rotated by said motor;

a film wind mechanism provided on a revolution orbit of said planet gear and meshed with and driven by said planet gear upon forward rotation of said motor to perform a film winding operation;

a film rewind mechanism provided on the revolution orbit of said planet gear and meshed with and driven by said planet gear upon reverse rotation of said motor to perform a film rewinding operation;

a focal point switching mechanism provide on the revolution

orbit of said planet gear from said film wind mechanism to said film rewind mechanism, and meshed with and driven by said planet gear upon reverse rotation of said motor to switch a focal length of a photographic lens of the camera; and

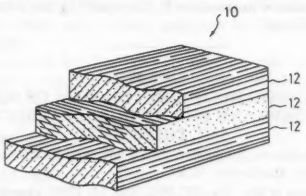
selecting means for selectively causing said planet gear to mesh with said film rewind mechanism or said focal point switching mechanism upon making said planet gear engage with or disengage from said focal point switching mechanism at the position in which said planet gear can mesh with said focal point switching mechanism when said planet gear is revolved toward said focal point switching mechanism and said film rewind mechanism by reverse rotation of said motor.

5,025,278

PLATE FOR LIGHT SHIELDING BLADE

Takashi Matsubara, Tokyo, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Mar. 27, 1990, Ser. No. 501,371
Claims priority, application Japan, Jun. 17, 1988, 63-148262
Int. Cl.[5] G03B *9/40*
U.S. Cl. 354—246 **12 Claims**



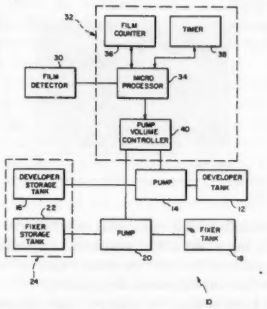
1. A thin plate having a thickness of 60 to 120 μm and comprising a laminate of plural carbon fiber reinforced resin sheets each having continuous carbon fibers oriented in a predetermined direction and epoxy resin enveloping said continuous fibers, said epoxy resin having a glass transition temperature which is equal to or more than 120° C.

5,025,279

PROCESS FOR REPLENISHING SOLUTIONS IN A FILM PROCESSOR

Roger D. Ellsworth, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 21, 1990, Ser. No. 496,753
Int. Cl.[5] G03D *3/06, 3/08*
U.S. Cl. 354—298 **7 Claims**



1. A process for replenishing a solution in a film processor wherein a series of film sheets are fed seriatim through a tank containing the solution, the process comprising:

detecting each film sheet fed through the solution.

incrementing a counter each time a film sheet is detected during a predetermined time period. and

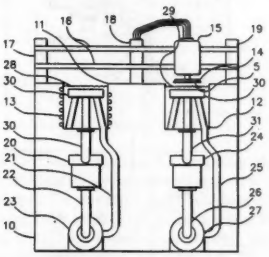
replenishing the solution in the tank as a function of the number of sheets detected during the time period with the volume of replenishment solution varying from (1) a first volume when the counter indicates a low number of sheets to (2) a second volume different than the first volume when the counter indicates a higher number of sheets.

5,025,280

IMMERSION DEVELOPMENT AND RINSE MACHINE AND PROCESS

William E. Lamb, Bellaire; Jerome L. Kowaleski, Meadows; Vojtech Haikl, Houston; Alan R. Bittancourt, Rosenberg, and Harvey S. Daugherty, Richmond, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 134,284, Dec. 17, 1987, Pat. No. 4,902,608.
This application Nov. 13, 1989, Ser. No. 436,160
Int. Cl.[5] G03D *3/06, 3/08*
U.S. Cl. 354—299 **10 Claims**



1. A semiconductor wafer processing apparatus wherein semiconductor wafers are spun developed and rinsed in developer fluid and a rinse fluid, comprising; first and second fluid tanks for holding the developer fluid and rinse fluid, each tank interconnected with a fluid circulation system, a vacuum chuck for holding a semiconductor wafer in an upside-down position, a track and actuation mechanism for moving the vacuum chuck in vertical and horizontal directions, and a spin motor for rotating said vacuum chuck and the semiconductor wafer in said developer and rinse fluids.

5,025,281

IMAGE RECORDING APPARATUS USING PHOTOSENSITIVE PRESSURE-SENSITIVE RECORDING MEDIUM

Takashi Nakata, Nagoya; Takashi Tomizawa, Aichi; Shigeyuki Hayashi, Nagoya; Motoshi Ohno, Nagoya, and Yoichi Horaguchi, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Dec. 13, 1988, Ser. No. 283,845
Claims priority, application Japan, Dec. 15, 1987, 62-317849
Int. Cl.[5] G03B *27/32, 27/52*
U.S. Cl. 355—27 **8 Claims**

1. An image recording apparatus for recording an image of an original on an elongated web-like image recording medium, said image recording medium having an imaging surface capable of forming a latent image thereon when exposed to light, said apparatus comprising:

a pair of main frames defining an internal space therebetween;

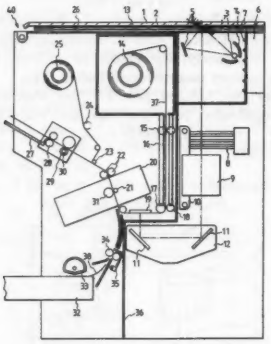
a light source for irradiating light;

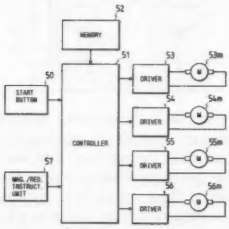
an original support unit for supporting said original to receive the light irradiated from said light source, said unit and said light source being movable at a first speed relative to each other so that said image on said original is sequentially scanned by said light;

an optical system secured to said main frames for receiving light reflected from said original and providing an image bearing light;

an exposure unit disposed within said internal space and defining an exposure zone through which said image recording medium is travelled wherein said image bearing light is controlled to form a latent image on said image recording medium;

a first driving unit for moving said recording medium at a feeding speed related to the first speed when said recording medium travels along the exposure zone;





a developing unit disposed downstream of said exposure unit and provided with a developing zone through which said recording medium passes for developing said latent image;

a second driving unit for moving said recording medium at a speed substantially equal to said feeding speed when said recording medium is developed by said developing unit; and

magnification/reduction means for setting a magnification/reduction factor that applied to said first speed determines said feeding speed, wherein said first and said second driving units control said feeding speed of the recording medium corresponding to the magnification/reduction factor adjustment of said first speed.

5,025,282

COLOR IMAGE FORMING APPARATUS

Hiroaki Nakamura, and Atsushi Takagi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 29, 1990, Ser. No. 604,850

Claims priority, application Japan, Oct. 30, 1989, 1-282595

Int. Cl.[5] G03B *27/80*

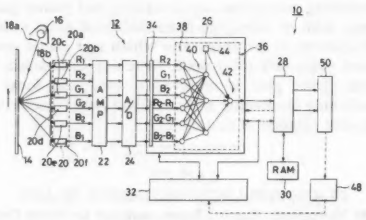
U.S. Cl. 355—38 **13 Claims**

1. A color image forming apparatus that comprises:

an image information detecting means for detecting a original image information carried on a document to be duplicated;

a computing means that has a learning capability and which computes image forming conditions as appropriate for a specified light-sensitive material for reproducing a desired image on the basis of said original image information;

a color image forming means that allows said light-sensitive material to be exposed under the computed image forming conditions and which processes the exposed light-sensitive material to reproduce a visible image; and



input means which, when said visible image does not reproduce appropriate colors and densities, supplies said computing means with correcting conditions for obtaining the appropriate colors and densities,

said computing means being so adapted as to learn the appropriate image forming conditions for the original image information in response to the inputting of said correcting conditions.

5,025,283

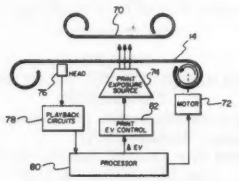
MAGNETIC RECORDING ON FILM OF SCENE PARAMETERS AND PHOTOFINISHING PROCESS FOR USE THEREWITH

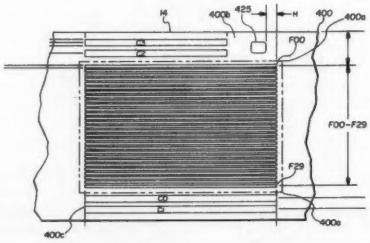
Gary L. Robison, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 407,994, Sep. 14, 1989, abandoned. This application Aug. 23, 1990, Ser. No. 571,008

Int. Cl.[5] G03B *27/52*

U.S. Cl. 355—40 **6 Claims**





6. In a photofinishing apparatus wherein previously developed film having a virtually transparent magnetic layer therein is exposed onto photosensitive print paper with a print exposure source, the improvement comprising:

magnetic head means for playing back data previously recorded in magnetic tracks on said film in registration with individual frames thereof;

print exposure value control means for varying the exposure

value employed by said print exposure source in exposing a frame on said print paper to said frame on said film; and

a processor, including means for:

a. reading through said magnetic head means data previously recorded on said magnetic tracks representing a difference between an ideal exposure value and an actual exposure value characteristic of said film frame, and

b. transmitting said difference to said print exposure value controller, whereby said controller changes the exposure value employed by said print exposure source so as to compensate for said difference in making a print from said film frame.

5,025,284

EXPOSURE METHOD AND EXPOSURE APPARATUS

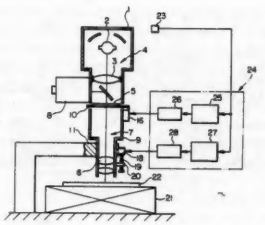
Susumu Komoriya, Tokorozawa; Hiroshi Nishizuka, Higashikurume; Shinya Nakagawa, Kodaira, and Hisashi Maejima, Higashiyamato, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 288,971, Dec. 23, 1988, which is a continuation of Ser. No. 70,388, Jul. 7, 1987, which is a division of Ser. No. 742,786, Jun. 10, 1985, Pat. No. 4,699,505. This application Sep. 5, 1990, Ser. No. 577,632

Claims priority, application Japan, Jun. 11, 1984, 59-118315

Int. Cl.[5] G03B *27/42, 27/52*

U.S. Cl. 355—53 **20 Claims**



1. An exposure apparatus for fabricating an integrated circuit device comprising:

(a) an XY table for holding and displacing a wafer for fabricating the integrated circuit device in a first plane;

(b) a mask holder for holding one of a mask and a reticle having a mask pattern on a first major surface thereof;

(c) a light source for generating an exposure light to expose the one of the mask and reticle;

(d) a projection lens system, for reducing and projecting the transmitted light from the one of the mask and reticle onto a photoresist film on a first major surface of the wafer, having a first set of at least one lens adjacent to the wafer and a second set of at least one lens adjacent to the one of the mask and reticle, the projection lens system being telecentric at least on the one of the mask and reticle side;

(e) atmospheric pressure detecting means for detecting the atmospheric pressure corresponding to an environment where the exposure apparatus is placed; and

(f) control means for controlling an optical distance between the first and second sets of at least one lens in accordance with the atmospheric pressure detected by the detecting means to adjust the demagnification of the projection lens system to a predetermined value.

5,025,285

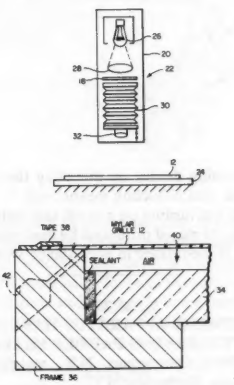
APPARATUS AND METHOD FOR SHADOW MOIRE MAPPING

Robert C. Schwarz, Dix Hills, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed May 10, 1989, Ser. No. 349,722

Int. Cl.[5] G03B *27/32*

U.S. Cl. 355—77 **5 Claims**



1. In a shadow Moire method for mapping plane displacement of an investigated structural surface, wherein a back lit grille is employed for casting a grille shadow on the surface which is viewed from behind the grille whereat fringes appear in relation to the out-of-plane displacement, the method for creating the grille comprising the steps:

positioning a flexible strip of photoreproduction material against a flat surface;

directing light through a master grille in optical alignment with the photoreproduction strip;

focusing an enlarged master grille image on the photoreproduction strip, the enlarged image having a lesser line density than the master grille by a ratio corresponding to the ratio of enlargement;

developing the enlarged grille image on the photoreproduction strip for utilization as a shadow Moire grille.

5,025,286

LASER BEAM IMAGE FORMING APPARATUS WITH SOS DETECTION

Hirofumi Hasegawa; Naoto Ohmori; Yukio Yamada, and Narutaka Yoshida, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jun. 29, 1989, Ser. No. 373,989

Claims priority, application Japan, Jun. 29, 1988, 63-162210; Jun. 29, 1988, 63-162211

Int. Cl.[5] G03G *15/04*

U.S. Cl. 355—244 **10 Claims**

1. An image forming apparatus, comprising:

supporting means for supporting an original;

a rotatable photosensitive member;

a laser beam radiating unit including a radiant element and a scanning device;

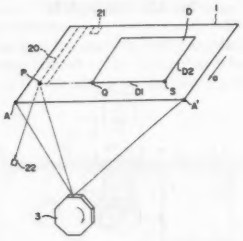
optical means for guiding the laser beam radiated from said laser beam radiating unit to said supporting means and for projecting a reflected image of the original onto said photosensitive member;

scanning means for relatively scanning the reflected image in the direction perpendicular to the direction in which said scanning device spreads the laser beams on the original;

reflecting means for reflecting the laser beam radiated from said laser beam radiating unit, said reflecting means being

provided on said supporting means outside of the area where said original is placed and extending in the scanning direction by said scanning means;

a sensor for producing a signal which determines the timing of starting outputting image data in the scanning direction



by said scanning device on detecting the laser beam reflected from said reflecting means; and

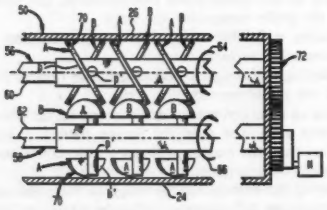
control means for turning on and off said radiant element in response to the signal produced by said sensor so that the laser beam is modulated in accordance with image data.

5,025,287

DEVELOPMENT APPARATUS HAVING DUAL INTERLEAVING PADDLE MIXERS

Thomas K. Hilbert, Spencerport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 18, 1989, Ser. No. 451,853
Int. Cl.[5] G03G *15/06*; B01F *7/00*
U.S. Cl. 355—245 **17 Claims**



1. In an electrostatographic copier or printer a development apparatus for developing latent images on an image-bearing member of the copier or printer using developer material consisting of charged toner particles and charged magnetic carrier particles, the development apparatus including:

(a) an elongate housing having a sump portion for holding, mixing and charging developer material, said sump portion consisting of first and second parallel, side-by-side cylindrical recessed sections within the bottom of said housing, said first and second recessed sections partially forming an overlapping segment therebetween;

(b) a development roller located in a top portion of the housing to be adjacent the image-bearing member of the copier or printer for moving charged developer material into applying relationship with electrostatic latent images thereon, thereby developing such images with toner particles;

(c) feed means between said sump portion and said development roller for feeding charged developer material from said sump portion to said development roller; and

(d) first and second mixers for producing developer material mixing and charging movement including a chopping action, a folding action, end-to-end flow, and side-to-side flow, thereby assuring high and reliable charge and toner concentration levels, as well as, even or uniform end-to-end accumulation and depletion of toner particles in the developer material, said first and second mixers each including:

(i) a rotatable shaft; and

(ii) first and second radially extending paddles connected to said shaft and forming an axially repeated set on said shaft, said first and second paddles being each attached to a short post member and connected to said shaft at a developer material moving attack angle X° less than normal, as measured relative to the axis of rotation of said shaft, and said first and second paddles being spaced circumferentially on said shaft an angle Y°; and

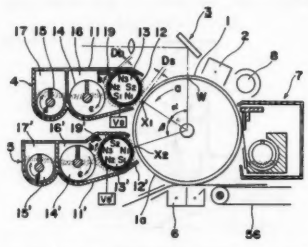
said first and second mixers being mounted side-by-side within said first and second recessed sections, respectively, of said sump portion such that said first and second paddles of said first mixer interleave within said overlapping segment of said recessed sections with said first and second paddles of said second mixer.

5,025,288

IMAGE FORMING APPARATUS CAPABLE OF PREVENTING SIMULTANEOUS ROTATION OF THE MAGNET ROLL AND THE DEVELOPING SLEEVE

Yasuhiro Kusuda, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 31, 1989, Ser. No. 429,650
Claims priority, application Japan, Nov. 1, 1988, 63-278352; Nov. 21, 1988, 63-294216; Nov. 21, 1988, 63-294217
Int. Cl.[5] G03G *15/09*
U.S. Cl. 355—251 **9 Claims**



1. An image forming apparatus arranged to develop an electrostatic latent image formed on an electrostatic latent image holding member by use of toner, said image forming apparatus comprising:

a developing sleeve rotatably provided to confront the electrostatic latent image holding member,

a sleeve driving means for rotating said developing sleeve,

a magnet roller provided within said developing sleeve and having a plurality of magnetic poles,

a magnet roller driving means for rotating said magnet roller through a predetermined angle, said magnet roller driving means being arranged to rotate said magnet roller between a first state where a magnetic pole thereof confronts the electrostatic latent image holding member and a second state where an intermediate portion between neighboring magnetic poles confronts said electrostatic latent image holding member, and

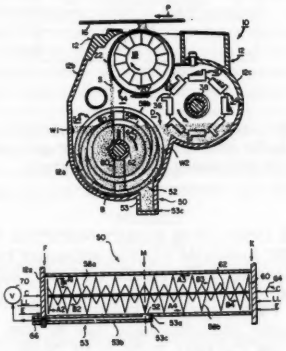
a control means for controlling said sleeve driving means and said magnet roller driving means in such a manner as to rotate the magnetic poles of said magnet roller from the first state to the second state after stopping rotation of said developing sleeve when the developing function is to be completed.

5,025,289

DEVELOPMENT APPARATUS HAVING SELF-CLOSING PURGING MECHANISM

Vladimir S. Guslits, Rochester, and John P. Swapceinski, Bergen, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 13, 1989, Ser. No. 434,198
Int. Cl.[5] G03G *15/09*
U.S. Cl. 355—253 7 Claims



1. A development apparatus in an electrostatographic copier or printer, the apparatus including:

(a) a housing having a bottom portion for holding developer material; and

(b) a mechanism, associated with said bottom portion of said housing for purging developer material from said housing, said purging mechanism including:

(i) an aperture in said bottom portion of said housing, for discharging developer material from said housing;

(ii) means, within said bottom portion of said housing, for moving developer material across said aperture; and

(iii) a developer material holding and transport conduit connected to the outside of said housing over said aperture, said conduit forming automatic self-closing means for blocking the flow of developer material out of said housing through said aperture, said automatic self-closing means including a developer material trapping elbow just below said aperture for trapping a small amount of developer material thereby causing developer material to block and close said aperture, said trapping elbow being formed by a short downward conduit section, and a long substantially horizontal conduit section, said horizontal conduit section having an open end from the outside into said elbow requiring no closing means thereto; and

(iv) transport means associated with said open end of said horizontal conduit section for selectively causing said developer material trapped in said elbow, and developer material discharging into said elbow, to flow through said horizontal conduit section and out of said open end thereof.

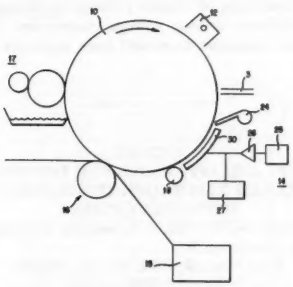
5,025,290

PULSED VOLTAGE DEVELOPMENT ELECTRODE CLEANER

Benzion Landa, Edmonton, Canada; Yakov Krumberg, and Yossef Adam, both of Rehovot, Israel, assignors to Savin Corporation, Stamford, Conn.

Continuation of Ser. No. 22,245, Mar. 5, 1987, abandoned. This application May 8, 1989, Ser. No. 349,961
Int. Cl.[5] G03G *15/06*
U.S. Cl. 355—265 17 Claims

1. In an electrophotographic apparatus having a photoconductor capable of carrying a latent electrostatic image and a development station with a development electrode spaced from said photoconductor, wherein charged toner particles are supplied to said photoconductor by said development electrode the improvement comprising:



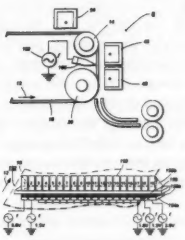
means for supplying an electrical pulse to said development electrode during the development of said latent electrostatic image wherein said pulse is sufficient to dislodge said charged toner particles from the surface of said development electrode and said pulse being insufficient to coat said charged particles onto said photoconductor.

5,025,291

EDGE EFFECT COMPENSATION IN HIGH FREQUENCY VIBRATORY ENERGY PRODUCING DEVICES FOR ELECTROPHOTOGRAPHIC IMAGING

William J. Nowak, Webster; Anthony A. Attardi, Rochester, and Daniel W. Costanza, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 2, 1990, Ser. No. 548,318
Int. Cl.[5] G03G *15/14*
U.S. Cl. 355—273 11 Claims



1. In an imaging device having a non-rigid member with a charge retentive surface moving along an endless path, means for creating a latent image on the charge retentive surface, means, for imagewise developing the latent image with toner, means for electrostatically transferring the developed toner image to a copy sheet, and a resonator for enhancing toner release from the charge retentive surface producing relatively high frequency vibratory energy and having a portion thereof adapted for contact across the non-rigid member, generally transverse to the direction of movement thereof, the resonator comprising:

a horn member for applying the high frequency vibratory energy to the non-rigid member, having a platform portion, a horn portion, and a contacting portion;

said horn member divided into a linear array of horn segments across said belt member, each horn segment including horn portion and contacting portion;

a linear array of vibratory energy producing elements, each

element coupled to said horn platform at a position corresponding to at least one of said horn segments, for generating the high frequency vibratory energy;

support means for supporting the combination of said vibratory energy producing means and said horn member;

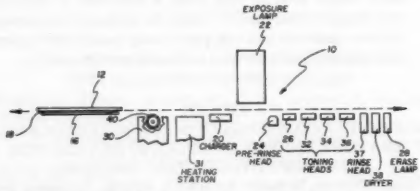
differential driving voltage means for differentially driving said linear array of vibratory energy producing elements with different driving voltage magnitudes, to produce different responses from said horn segments across the array.

5,025,292

METHOD AND APPARATUS FOR IMPROVING A MULTI-COLOR ELECTROPHOTOGRAPHIC IMAGE USING HEAT FUSING

Lawrence C. Steele, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 28, 1990, Ser. No. 500,431
Int. Cl.[5] G03G *15/01*
U.S. Cl. 355—326 **16 Claims**



1. In an apparatus for producing a multi-stage electrophotographic image comprising means for providing an electrophotographic medium on a carrier therefor, means for translating the carrier and medium together over a predetermined path, means for charging the medium, means for exposing the medium to a first light-borne image, means for toning the image bearing charged region of the medium to produce a first color visible image, means for drying said image, and means for returning the carrier to the starting position to repeat the foregoing steps of charging said medium, exposing it to a second light-borne image, toning said medium to produce a second visible image, and drying said image, the improvement comprising means for heating the surface of the first toned image after said first toning and drying steps and prior to said second charging step to smooth the toned image and prevent unwanted toner particles from adhering to the first toned image.

5,025,293

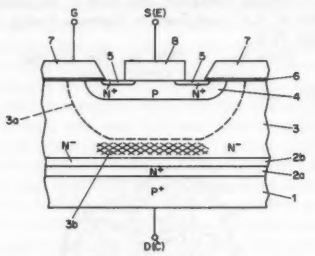
CONDUCTIVITY MODULATION TYPE MOSFET

Yasukazu Seki, Kanagawa, Japan, assignor to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Jan. 22, 1990, Ser. No. 467,848
Claims priority, application Japan, Jan. 25, 1989, 1-15901
Int. Cl.[5] H01L *29/78*
U.S. Cl. 357—23.4 **8 Claims**

1. In a conductivity modulation MOSFET having a semiconductor substrate of a first conductive type, a first buffer layer of a second conductive type formed on said substrate, a conductivity modulation layer of a second conductive type, and characterized by a low on resistance and a turn off time, the improvement comprising:

a second buffer layer of the second conductive type disposed between said first buffer layer and said conductivity modulation layer, thinner than and having a higher impurity concentration than said first buffer layer, and interspersed with a plurality of heavy metal atoms;



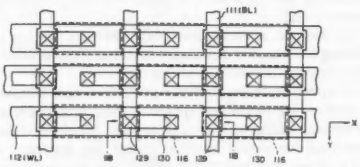
whereby the concentration of heavy metal atoms within said second buffer layer is effective in shortening said turn off time while maintaining a low on resistance.

5,025,294

METAL INSULATOR SEMICONDUCTOR TYPE DYNAMIC RANDOM ACCESS MEMORY DEVICE

Taiji Ema, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 7, 1989, Ser. No. 362,222
Claims priority, application Japan, Jun. 29, 1988, 63-162189
Int. Cl.[5] H01L *29/78, 27/02, 29/34*
U.S. Cl. 357—23.6 **23 Claims**



1. A dynamic random access memory device comprising:

a substrate having a main surface;

a field oxide film formed on the main surface of the substrate and patterned to define a matrix array of plural exposed areas of the substrate main surface;

a matrix array of plural transistors respectively formed in said exposed areas of said substrate, said plural transistors and respective, plural exposed areas being aligned in corresponding, parallel sets in each of mutually traverse, first and second directions parallel to the main surface of the substrate, and each transistor comprising a pair of associated source and drain regions, spaced apart within said respective area and defining a channel therebetween extending in the first direction;

plural bit lines formed in said substrate and extending in parallel relationship in the second direction, each said bit line being associated with a respective set of transistors aligned in said second direction and said source regions thereof comprising portions of said associated bit line;

gate oxidation films formed on said exposed areas of said main surface of said substrate and covering the respective, said associated source and drain regions;

plural word lines formed on said field oxidation and gate oxidation films and extending in parallel relationship in the first direction, each said word line being associated with a respective set of transistors aligned in the first direction and being disposed above and separated by the corresponding gate oxidation films from the respective, associated sources and drains of the associated, aligned set of transistors and serving in common as the respective gate electrodes thereof;

plural contact holes respectively associated with said plural

drain regions and extending through the respective said word lines and gate oxidation films in a third direction, transverse to the main surface of the substrate, each contact hole having corresponding sidewalls and being aligned with and exposing at least a portion of a respectively associated drain region;

an insulating film formed on and covering said word lines and said transverse sidewalls of each of said contact holes and partially covering the surfaces of said drain regions exposed through said respective contact holes; and

plural storage capacitors respectively associated with said plural transistors, each storage capacitor comprising a storage electrode, formed on said insulating film and spaced thereby from the associated word line, extending in correspondence with, and above, the associated transistor and adjacent field oxide film, each said storage capacitor extending through the corresponding contact hole and contacting the drain region of the respectively associated transistor, a dielectric film formed on said storage electrode, a dielectric film formed on said storage electrode, and an opposed electrode formed on said dielectric film.

5,025,295

THREE-DIMENSIONAL ONE-DIMENSIONAL CELL ARRANGEMENT FOR DYNAMIC SEMICONDUCTOR MEMORIES AND METHOD FOR THE MANUFACTURE OF A BIT LINE CONTACT

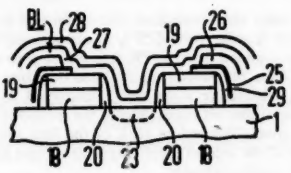
Karl-Heinz Kuesters, Munich; Wolfgang Mueller, Putzbrunn, and Gerd Enders, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 312,303, Feb. 17, 1989, abandoned, which is a continuation of Ser. No. 64,613, Jun. 22, 1987, abandoned. This application Jan. 16, 1990, Ser. No. 464,685

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1987, 3707241

Int. Cl.[5] H01L *29/68, 29/34, 29/06*

U.S. Cl. 357—23.6 **10 Claims**



1. A semiconductor device comprising:

a doped semiconductor substrate;

a switching field effect transistor having an insulated gate electrode at the surface of said substrate and source and drain zones in said substrate;

a first insulating layer covering said insulated gate electrode at the surface of said substrate;

a trench capacitor formed in a trench in said substrate under said field effect transistor and electrically connected to a source or drain zone thereof;

a bit line spaced above the level of the insulated gate electrode by both an intermediate insulating layer and said first insulating layer, said intermediate insulating layer comprising a triple layer of silicon oxide/silicon nitride/-silicon oxide, whereby the silicon nitride layer is significantly thinner than the silicon oxide layer lying thereon but is at least 10 nm thick, the layer adjacent to said bit line being a silicon oxide layer, a bit line contacting recess formed in said intermediate insulating layer for the electrical connection of said bit line to said drain zone, said bit line overlapping said insulated gate electrode, said bit lien also overlapping a neighboring field oxide region.

5,025,296

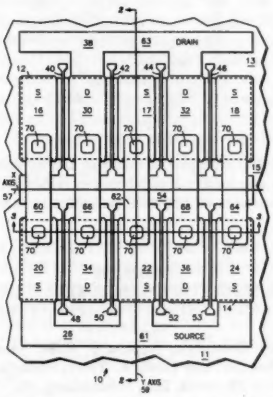
CENTER TAPPED FET

Craig L. Fullerton, Scottsdale, and Warren L. Seely, Chandler, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 161,826, Feb. 29, 1988, abandoned. This application Sep. 4, 1990, Ser. No. 577,840

Int. Cl.[5] H01L *29/80, 29/78, 27/10*

U.S. Cl. 357—23.8 **25 Claims**



1. A field effect transistor including in combination:

a first active semiconductor area;

a first source conductor and a first drain conductor located on said first active semiconductor area;

a second active semiconductor area located adjacent to but separated from said first active semiconductor area;

a second source conductor and a second drain conductor located on said second active semiconductor area;

an inactive area located between said first active semiconductor area and said second active semiconductor area;

gate bus means located on said inactive area;

first gate finger contact means extending from said gate bus means in a first direction across a portion of said inactive area and across a portion of said first active semiconductor area between said first source conductor and said first drain conductor;

second gate finger contact means extending from said gate bus means in a direction opposite to said first direction across a portion of said inactive area and across a portion of said second active semiconductor area between said second source area and said second drain area; and

said gate finger contact means and said source and drain conductors all being located in the same plane.

5,025,297

SEMICONDUCTOR LIGHT BEAM POSITION SENSOR ELEMENT AND A POSITION SENSOR AND A PICTURE IMAGE INPUT DEVICE EACH USING THE SAME

Satoru Murakami, Kobe; Minori Yamaguchi, Akashi; Akimine Hayashi, Kobe; Masataka Kondo, Kobe, and Yoshihisa Tawada, Kobe, all of Japan, assignors to Kanegafuchi Chemical Industry Co., Ltd., Osaka, Japan

Filed Mar. 7, 1989, Ser. No. 320,149

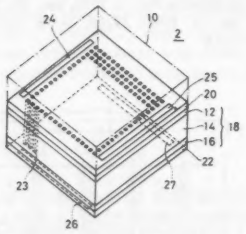
Claims priority, application Japan, Mar. 7, 1988, 63-53032

Int. Cl.[5] H01L *27/14*

U.S. Cl. 357—30 **8 Claims**

1. A semiconductor light beam position sensor element comprising a semiconductor layer composed of p-type, i-type and n-type semiconductors successively formed and two electrically conductive layers one of which is disposed on one side of said semiconductor layer with the other of which on the other side, at least one of said electrically conductive layers

being made of a transparent material, at least the other electrically conductive layer and said semiconductor layer having a multiplicity of common apertures running in the thickness direction of the element, the apertures being filled with one of



translucent and transparent material and at least one of said electrically conductive layers being provided with at least one pair of electrodes of opposite polarities in marginal regions thereof.

5,025,298

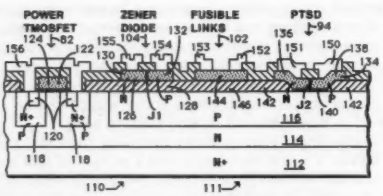
SEMICONDUCTOR STRUCTURE WITH CLOSELY COUPLED SUBSTRATE TEMPERATURE SENSE ELEMENT

Gary V. Fay, Scottsdale; Stephen P. Robb, Tempe; Judith L. Sutor, Chandler, and Lewis E. Terry, Phoenix, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 22, 1989, Ser. No. 397,052

Int. Cl.[5] **H01L** *27/02, 29/78, 29/04*

U.S. Cl. 357—41 **9 Claims**



1. A semiconductor apparatus having thereon semiconductor elements with thin and thick dielectric regions and a substrate temperature sensing means, comprising:

a semiconductor substrate;

a dielectric located on the substrate and having at least one thin region of about 0.1 micrometers or less in thickness, and having a thicker region; and

a semiconductor layer having a forward biased PN junction located on the at least one thin region for sensing substrate temperature through the thin region of the dielectric.

5,025,299

CELLULAR POWER SEMICONDUCTOR DEVICE

Jacques Arnould, Aix En Provence, France, assignor to Telemecanique, France

Filed Feb. 2, 1990, Ser. No. 473,766

Claims priority, application France, Feb. 3, 1989, 89 01409

Int. Cl.[5] **H01L** *27/10, 27/02, 29/72*

U.S. Cl. 357—45 **14 Claims**

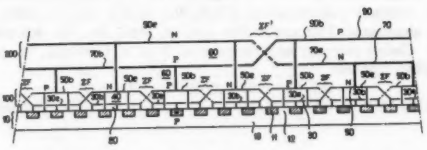
1. A cellular power semiconductor device of the type comprising a plurality of n-type or p-type zones (**11**) diffused on the surface of a p-type or n-type substrate (**10**) respectively so as to present on the surface of the substrate a plurality of diffused zones (**11**) and zones of emergence (**12**) of the substrate so arranged in relation to one another as to form a network of cells alternately of n-type and p-type, and means for connecting all the cells of each type to one another and to a connection area (**90e, 90b**) of the device, characterized in that said means comprise:

a first conductive sheet (**30**) which extents above the surface of the substrate and is insulated therefrom and is divided in first frontier zones (ZF), in accordance with first predetermined patterns (**33**), into first and second alternate zones (**30e, 30b**) disposed in a network and insulated from one another, said first conductive sheet being connected to each of the subjacent n-type cells in its first zones and to each of the subjacent p-type cells in its second zones via first conductive pins;

a second conductive sheet (**50**) which extends above the first sheet and is insulated therefrom and is also divided in the first frontier zones (ZF), in accordance with second predetermined patterns (**53**), into first and second alternate zones (**50b, 50e**) disposed in a network, insulated from one another and respectively superimposed on the first and second zones (**30e, 30b**) of the first conductive sheet, said second conductive sheet being connected to each of the subjacent p-type cells in its first zones and to each of the subjacent n-type cells in its second zones via second conductive pins (**31**) which extend, in line with each of the cells, through the first sheet (**30**) while remaining insulated therefrom and without breaking the electrical continuity thereof;

the first and second sheets being so connected to one another in said first frontier zones (ZF) that each of the first and second zones (**30e, 30b**) of the first sheet (**30**) are connected, inside said frontier zones, to the adjacent second and first zones (**50e, 50b**) respectively of the second sheet (**50**);

a third conductive sheet (**70**) which extends above the second sheet and is insulated therefrom and is divided in a second frontier zone (ZF'), in accordance with a third predetermined pattern (**73**), into a first zone and a second zone (**70e, 70b**) which are insulated from one another, said third conductive sheet being connected to each of the second subjacent zones (**50e**) of the second sheet (**50**) in its first zone (**70e**) and to each of the first subjacent zones (**50b**) of the second sheet (**50**) in its second zone (**70b**) via third conductive pins;



a fourth conductive sheet (**90**) which extends above the third sheet (**70**) and is insulated therefrom and is also divided in the second frontier zone (ZF'), in accordance with a fourth predetermined pattern (**93**), into a first zone and a second zone (**90b, 90e**) which are insulated from one another and are superimposed on the first zone and the second zone (**70e, 70b**) of the third conductive sheet respectively, said fourth conductive sheet being connected to each of the first subjacent zones (**50b**) on the second sheet (**50**) in its first zone (**90b**) and to each of the second subjacent zones (**50e**) of the second sheet (**50**) in its second zone (**90e**) via fourth conductive pins (**71**) which extend, in line with each of the cells, through the second sheet (**70**) while remaining insulated therefrom and without breaking its electric continuity;

the third and fourth sheets (**70, 90**) being connected to one another in said second frontier zone (ZF') so that the first and second zones (**70e, 70b**) of the third sheet (**70**) are connected, inside said frontier zone, to the second and first zone (**90e, 90b**) of the fourth sheet respectively, said second and first zones (**90e, 90b**) each defining a connection area of the device, and

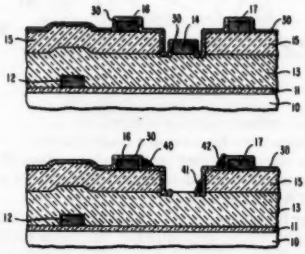
the thickness of the third and fourth sheets (**70, 90**) is greater

than that of the first and second sheets (30, 50), and the third and fourth pins are larger than the first and second pins.

5,025,300
INTEGRATED CIRCUITS HAVING IMPROVED FUSIBLE LINKS

James N. Billig, Slatington; James D. Chlipala; Kuo H. Lee, both of Lower Macungie Township, Lehigh County, and William J. Nagy, Bethlehem, all of Pa., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 373,763, Jun. 30, 1989, abandoned. This application Jul. 25, 1990, Ser. No. 560,462
Int. Cl.[5] H01L *29/34, 27/02, 23/48*
U.S. Cl. 357—51 13 Claims



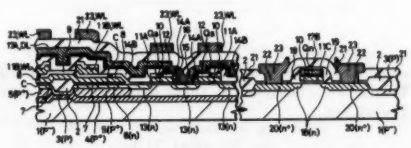
1. An integrated circuit comprising a patterned metal level formed on a first layer of dielectric material (e.g., 13), and a second layer of dielectric material (e.g., 15) of a given thickness covering portions of said patterned metal level, wherein said patterned metal level includes at least one conductive fusible link portion (e.g., 14) that is not covered by said second layer of dielectric material,

Characterized in that said fusible link portion and said second layer of dielectric material are covered by a protective dielectric layer (e.g., 30) having a thickness less than said given thickness, wherein said second layer and said protective dielectric layer each essentially comprise silicon dioxide.

5,025,301
DRAM WHICH USES MISFETS IN THE PERIPHERAL CIRCUIT

Shinji Shimizu, Hoya, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 35,010, Mar. 26, 1987, Pat. No. 4,845,544. This application Apr. 25, 1989, Ser. No. 343,879
Claims priority, application Japan, Mar. 26, 1986, 61-65695
Int. Cl.[5] H01L *29/34, 27/01, 29/00, 29/78*
U.S. Cl. 357—54 15 Claims



1. A semiconductor integrated circuit device having a plurality of data lines extending in a row direction, a plurality of word lines extending in a column direction and a plurality of memory cells connected to the data lines and the word lines, each memory cell comprising a switching transistor element and a capacitor element connected in series;

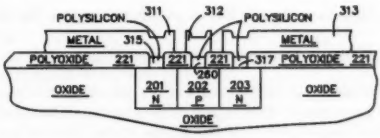
wherein the switching transistor element includes a gate electrode, over a semiconductor substrate, the gate electrode having sides, the transistor element including first and second semiconductor regions arranged at the sides of the gate electrode and extending to a surface of the semiconductor substrate, the first semiconductor region being connected to a data line, and the second semiconductor region connected to said capacitor element;

and wherein the device further comprises a first insulating film on said gate electrode in order to isolate said gate electrode from said data lines, wherein said first insulating film has a first insulating film opening, for exposing said first semiconductor region through the first insulating film; a second insulating film on one of the sides of said gate electrode in order to isolate said gate electrode from said data lines, the second insulating film being an insulating film formed by anisotropic etching, the data lines being provided directly in contact with the second insulating film; and a third insulating film, provided on said first insulating film, and having an opening at said first insulating film opening so as to expose the first semiconductor region through the third insulating film.

5,025,302
PNP TYPE LATERAL TRANSISTOR WITH MINIMAL SUBSTRATE OPERATION INTERFERENCE

Sidney I. Soclof, San Gabriel, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 279,482, Jul. 1, 1981, abandoned. This application Jun. 16, 1987, Ser. No. 62,754
Int. Cl.[5] H01L *29/72, 29/06*
U.S. Cl. 357—55 5 Claims



1. An array of sub-micron dimensioned PNP-type lateral transistors formed in a substrate doped N-type, each comprising in combination:

spaced apart slots in the substrate through selected sides of which N+-type doping is received into the adjacent substrate and driven in followed by P or P+ doping driven in through opposed sides;

said spaced apart slots comprising spaced apart pairs of slots orthogonally related to further pairs of slots with each pair of slots and each further pair of slots bounding a portion of the substrate comprising a region between said opposed sides;

said slots filled with field oxide and surrounding each said region where a transistor will be formed;

said P+ doping on the inner sides of said spaced apart slots within said regions comprising an emitter and a collector electrode area;

said N+ doping and the N substrate in said region between the P+ doping comprising a graded base electrode area;

electrical contacts on each P+ electrode area and on the graded N+N electrode area; and,

each contact measuring down to 0.1 micron across.

5,025,303
PRODUCT OF PILLAR ALIGNMENT AND FORMATION PROCESS

Jeffrey E. Brighton, Katy, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 26, 1988, Ser. No. 161,573
Int. Cl.[5] H01L *23/48*
U.S. Cl. 357—68 3 Claims

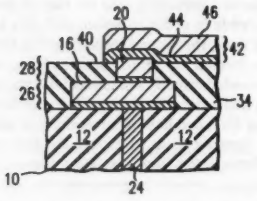
1. A product formed by a method of interconnecting metal

layers through an intermediate insulating layer, said method comprising the steps of:

(a) providing a substrate having an aligning structure;

(b) forming first and overlying pillar layers of electrically conducting material on said substrate;

(c) forming a first layer pattern aligned with said aligning structure in said first layer and a pillar pattern aligned with said first layer pattern in said pillar layer;



(d) depositing an insulating layer over said first and pillar layers;

(e) removing portions of said insulating layer to expose a portion of said pillar layer; and

(f) depositing a second layer of electrically conducting material over said pillar and insulating layers to form a second layer pattern so that said pillar layer connects said first layer to said second layer.

5,025,304

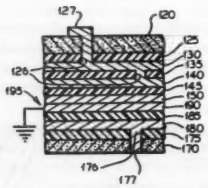
HIGH DENSITY SEMICONDUCTOR STRUCTURE AND METHOD OF MAKING THE SAME

Arnold Reisman, and Iwona Turlik, both of Raleigh, N.C., assignors to MCNC, Research Triangle Park, N.C. and Northern Telecom Limited, Montreal, Canada

Filed Nov. 29, 1988, Ser. No. 277,607

Int. Cl.[5] H01L *23/48*

U.S. Cl. 357—71 **3 Claims**



1. A buried metal layer semiconductor device comprising:

a substrate;

first and second buried metal layers on said substrate, said first and second buried metal layers having an oxide bond therebetween, said oxide bond being sufficiently thick to form a first buried insulating layer between said first and second buried metal layers, said first buried insulating layer being an oxide of said first buried metal layer;

a second buried insulating layer on said second buried metal layer; and,

a semiconductor layer on said second buried insulating layer.

5,025,305

SEMICONDUCTOR DEVICE FOR DETECTING OR EMITTING A MAGNETIC LINE OF FORCE OR LIGHT

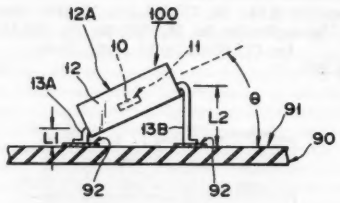
Yutaka Tomisawa, Yokohama; Toshikazu Fukuda, Kawasaki, and Kazuhiko Inoue, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 1, 1990, Ser. No. 517,294

Claims priority, application Japan, May 18, 1989, 1-125311

Int. Cl.[5] H01L *23/28, 23/02, 23/12, 27/14*

U.S. Cl. 357—72 **10 Claims**



1. A semiconductor device comprising:

a semiconductor chip having a major surface;

an active element formed on the major surface of said semiconductor chip, for detecting at least one of a magnetic line of force and light;

a package for housing said semiconductor chip, said package having an upper surface facing the major surface of said semiconductor chip, a lower surface opposing the upper surface, and a plurality of sides connecting the upper and lower surfaces;

a first lead having first and second portions terminating respectfully at first and second ends, the first portion of said first lead being guided from a first side of said plurality of sides into said package, the first end of said first lead being electrically connected to said semiconductor chip, and the second portion of said first lead extending along the first side and being bent toward the lower surface of said package;

a second lead having first and second portions terminating respectfully at first and second ends, the first portion of said second lead being guided from a second side of said plurality of sides opposing the first side into said package, the first end of said second lead being electrically connected to said semiconductor chip, and the second portion of said second lead extending along the second side and being bent toward the lower surface of said package; and

wherein the length of said second lead between the position at which said second lead is bent and the second end of said second lead is different from the length of said first lead between the position at which said first lead is bent and the second end of said first lead, and wherein the active element is inclined with respect to a line defined by the second ends of said first and second leads.

5,025,306

ASSEMBLY OF SEMICONDUCTOR CHIPS

Randall E. Johnson, Carrollton, and James M. Drumm, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 9, 1988, Ser. No. 230,203

Int. Cl.[5] H01L *25/10*

U.S. Cl. 357—75 **10 Claims**

3. A three dimensional circuit package comprising:

a first semiconductor circuit chip having pads on its periphery;

a first dielectric carrier over at least a portion of said first chip;

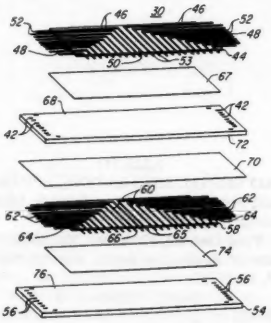
a first plurality of conductors positioned on the carrier between said first chip and said first carrier, substantially within the periphery of said first chip, one end of each

conductor connected to a chip pad, and the other end of each connector extending beyond a single edge of said first chip;

a second semiconductor circuit chip having second pads on its periphery;

a second dielectric carrier over at least a portion of said second chip;

a second plurality of conductors mounted on the second carrier between said second chip and said second carrier,



substantially within the periphery of said second chip, one end of each of said second conductors connected to said second pads, and the other end of each of said second conductors extending beyond the same edge of said second chip as the corresponding edge of said first chip; and an interconnect substrate having a plurality of conductive means thereon electrically interconnected with said first and second plurality of conductor ends that extend beyond the end of said first and second chips, respectively.

5,025,307

MODULAR SEMICONDUCTOR DEVICE

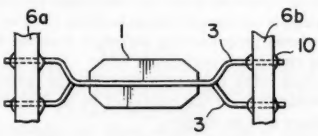
Tetsuya Ueda; Toru Tachikawa, and Masataka Takehara, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Mar. 29, 1990, Ser. No. 501,276

Claims priority, application Japan, Mar. 30, 1989, 1-80486

Int. Cl.[5] H01L *39/02, 23/02, 23/12, 23/16*

U.S. Cl. 357—80 **12 Claims**



1. A modular semiconductor device comprising:

a first pair of generally parallel first electronic circuit boards, each having first and second edges;

at least one integrated circuit disposed generally perpendicular to and mechanically and electrically connected to each of said first pair of first electronic circuit boards; and

first electrical connection means disposed along the first edge of each of said first pair of first electronic circuit boards for establishing electrical connections with external equipment and for supporting said first pair of first electronic circuit boards when connected to external equipment wherein said first electrical connection means comprises a plurality of external electrodes disposed on each of said first electronic circuit boards and a plurality of clip leads, each clip lead including a clip portion contacting one of said external electrodes and engaging one of said electronic circuit boards and a lead portion extending from said clip portion for connection to external equipment, alternating lead portions disposed on each of said first electronic circuit boards being offset from each other.

5,025,308

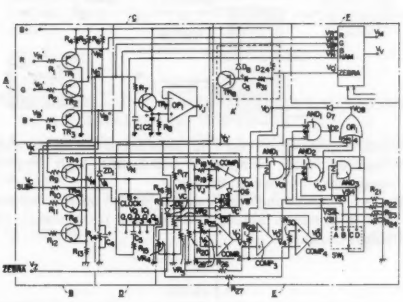
ZEBRA SIGNAL GENERATING CIRCUIT OF A VIDEO CAMERA

Hyo-Sam Lee, Seoul, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Apr. 6, 1990, Ser. No. 505,264

Int. Cl.[5] H04N *17/02*

U.S. Cl. 358—10 **5 Claims**



1. A zebra signal generating circuit of a video camera, comprising:

video signal amplifying means for generating amplified red, green, and blue video signals;

non-additive mixing video signal means for outputting a non-additive mixing video signal proportional to an average value of the red, green, and blue video signals utilizing the amplified red, green, and blue video signals from said video signal amplifying means;

video signal integrating means for amplifying and successively integrating the green video amplified signal of the red, green, and blue amplified signals from said video signal amplifying means;

zebra signal generating means for generating comb teeth pattern signals in response to reception of a control signal from a control terminal; and

zebra signal control means for comparing the zebra signal with a reference voltage and generating the zebra signal in stages by controlling and switching through a logic circuit.

5,025,309

EXTENDED DEFINITION WIDESCREEN TELEVISION SIGNAL PROCESSING SYSTEM

Michael A. Isnardi, Plainsboro, N.J., assignor to RCA Licensing Corporation, Princeton, N.J.

Filed Dec. 29, 1987, Ser. No. 139,340

Claims priority, application United Kingdom, Sep. 14, 1987, 8721565

Int. Cl.[5] H04N *7/04, 11/00, 11/12*

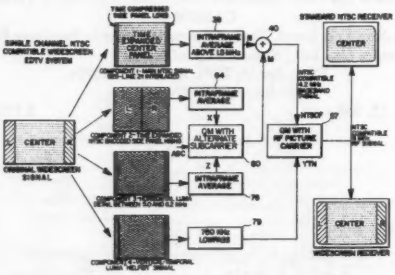
U.S. Cl. 358—12 **62 Claims**

1. A system for processing a television-type signal, comprising:

means for providing a television-type signal representative of a widescreen image having an associated primary image information portion with an image aspect ratio greater than that of an associated secondary image information portion, an overall image aspect ratio greater than that of a standard television image, and enhanced image resolution relative to a standard television signal image;

means responsive to said television signal for developing a baseband first component comprising information representative of a standard aspect ratio image;

means responsive to said television signal for developing a baseband second component comprising secondary image portion information having an aspect ratio less than that of standard television image;



means responsive to said television signal for developing a baseband third component comprising high frequency image detail information; and

means for combining said first, second and third components into a common baseband signal for transmission via a single channel.

5,025,310

CLOCK PULSE GENERATOR CAPABLE OF BEING SWITCHED TO PROCESS BOTH STANDARD AND NON-STANDARD TELEVISION SIGNALS

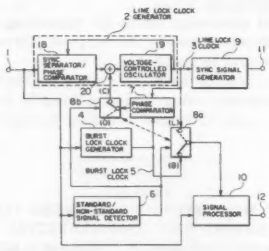
Hiroshi Sekiya; Toshiyuki Kurita, both of Yokohama; Nobufumi Nakagaki, Tokyo, and Toshinori Murata, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Video Engineering, Inc., Yokohama, both of Japan

Filed Mar. 23, 1990, Ser. No. 497,973

Claims priority, application Japan, Mar. 23, 1989, 1-69382; Jul. 19, 1989, 1-184686

Int. Cl.[5] H04N *9/45, 9/455, 9/64, 5/04*

U.S. Cl. 358—19 **12 Claims**



1. A clock pulse generator comprising:

a first clock pulse generating means for generating a first clock pulse signal synchronized with a color burst signal contained in a video signal;

a second clock pulse generating means for generating a second clock pulse signal synchronized with a horizontal synchronizing signal contained in said video signal;

a detection means for detecting whether said video signal accords with a predetermined standard or not;

a phase control means for synchronizing the phase of said second clock pulse signal with the phase of said first clock pulse signal when said detection means makes a decision that said video signal accords with said standard;

a selection means supplied with said first and second clock pulse signals and for selecting one of said first and second clock pulse signals in accordance with the result of the detection through said detection means; and

said second clock pulse signal being supplied to a synchronizing signal generating means to make said synchronizing signal generating means generate a synchronizing signal based on said second clock pulse signal, the selected clock pulse signal being supplied from said selection means to a signal processing circuit to make said signal processing circuit perform signal processing upon said video signal based on said selected clock pulse signal.

5,025,311

VIDEO SIGNAL SEPARATING APPARATUS

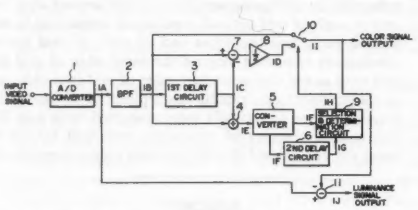
Osamu Hosoi, Neyagawa, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 22, 1988, Ser. No. 288,479

Claims priority, application Japan, Dec. 28, 1987, 62-331957; Feb. 5, 1988, 63-26102

Int. Cl.[5] H04N *9/78*

U.S. Cl. 358—31 **7 Claims**



1. A video signal separating apparatus comprising:

an analog-to-digital converter for converting a video signal to a digital video signal;

a band-pass filter for passing a color signal band of the digital video signal;

a first delay circuit for delaying a first color signal passed from the filter by n horizontal periods where n is an integer;

a first-calculating circuit for calculating out the sum of the first color signal and a delayed version of the first color signal outputted from the first delay circuit to thereby calculate out the difference between these signals;

a converter for converting the output from the first calculating circuit to a correlation value;

a second delay circuit for delaying the correlation value outputted from the converter by m horizontal periods where m is an integer;

a second calculating circuit for calculating to halve the difference between the first color signal and a delayed version of the first color signal from the first delay circuit;

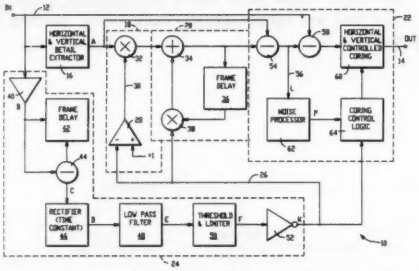
a switching circuit for outputting either one of a second color signal output from the second calculating circuit and the first color signal; and

a selection and determination circuit for determining which of the first and second color signals should be selected as the output from the switching circuit in accordance with the correlation values output from the converter and the second delay circuit, whereby the signal from the switching circuit is used as a third color signal to be outputted as an output color signal, and the third color signal is then subtracted from the video signal to produce an output luminance signal.

5,025,312
MOTION-ADAPTIVE VIDEO NOISE REDUCTION SYSTEM USING RECIRCULATION AND CORING

Yves C. Faroudja, 26595 Anacapa Dr., Los Altos, Calif. 94022

Filed Mar. 30, 1990, Ser. No. 503,313
Int. Cl.[5] H04N *9/64, 5/713*
U.S. Cl. 358—36 31 Claims



1. A noise reduction system for reducing random noise within a video signal for providing a picture image upon a television display, the system comprising:

an input for receiving the video signal including transmission path noise and an output for putting out the video signal after removal of the transmission path noise,

detail separation means connected to the input for separating low amplitude level picture detail components and the transmission path noise from the video signal,

recirculation loop means connected for recirculating a fractional amount of the separated low amplitude level picture detail components and the transmission path noise, the fractional amount being controlled by a motion control signal in order to be higher when motion is lower and lower when motion is higher, so as to separate the transmission path noise from the low amplitude level picture detail components for non-motion portions of the picture image,

combiner means for subtracting the separated transmission path noise from non-motion portions of the picture image of the video signal thereby to provide a first noise reduction mode, and

coring means connected for coring in function of motion portions of the picture image of the video signal in accordance with the motion control signal; and,

motion detection and control signal generation means connected to the input for generating the motion control signal as a function of detected motion in the picture image of the video signal.

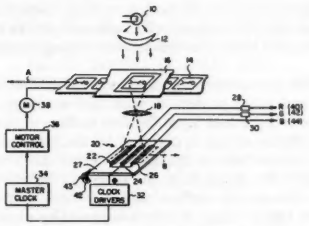
5,025,313
SYSTEM FOR MINIMIZING OPTICAL DISTORTIONS AND CHROMATIC ABERRATIONS IN A LINEAR COLOR SCANNER

Kenneth A. Parulski, and David Kessler, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 16, 1989, Ser. No. 422,331
Int. Cl.[5] H04N *9/11, 5/253*
U.S. Cl. 358—54 7 Claims

1. In a color image scanning apparatus of the type having means including image forming optics for projecting a two-dimensional color image, a color image sensor means having a plurality of linear array sensors mounted in a flat plane with each linear array being responsive to a particular color for providing an output indicative of the intensity of the light impinging thereon, means for scanning the projected image at a predetermined line scan rate, and means for continuously displacing the projected image in a direction perpendicular to the line scan to effect an image raster scan composed of a number of spaced lines, the improvement comprising:

a transparent layer of material having an index of refraction for correcting the focus of the projected image from said

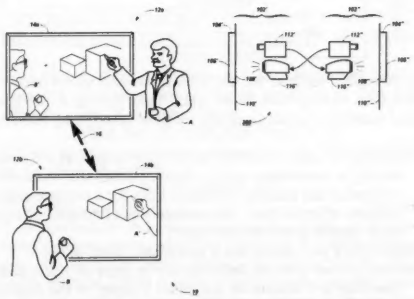


forming optics positioned over at least one of said linear arrays.

5,025,314
APPARATUS ALLOWING REMOTE INTERACTIVE USE OF A PLURALITY OF WRITING SURFACES

John C. Tang, Palo Alto, and Scott L. Minneman, San Francisco, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 30, 1990, Ser. No. 559,486
Int. Cl.[5] H04N *7/18*
U.S. Cl. 358—93 12 Claims



1. An apparatus for remote interactive communication, comprising:

first and second writing/display screens, each writing/display screen having a first surface for receiving indicia imparted by a user thereupon and a second surface opposite said first surface for diffusing light incident thereupon;

a first video camera positioned to capture substantially only those images imparted on the first surface of the first writing/display screen by imaging the second surface of the first writing/display screen;

a second video camera positioned to capture substantially

only those images imparted on the first surface of the second writing/display screen by imaging the second surface of the second writing/display screen;

a first video projector positioned to project an image onto the second surface of the first writing/display screen;

a second video projector positioned to project an image onto the second surface of the second writing/display screen; and

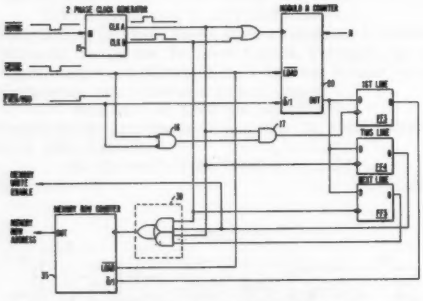
means for interconnecting the first and second video cameras and video projectors such that an image of indicia imparted by a user upon the first surface of the first writing/display screen is detected by the first video camera and transmitted to the second video projector which projects the image from the first writing/display screen onto the second surface of the second writing/display screen and an image of indicia imparted by a user upon the first surface of the second writing/display screen is detected by the second video camera and transmitted to the first video projector which projects the image from the second writing/display screen onto the second surface of the first writing/display screen to thereby form an optical composite of the images on the first surfaces of the first and second writing/display screens.

5,025,315

METHOD AND APPARATUS FOR SCALING INTERLACED IMAGES

Arun Johary, and Mark A. Rosenau, both of San Jose, Calif., assignors to Chips and Technologies, Inc., San Jose, Calif.

Filed Sep. 6, 1990, Ser. No. 578,704
Int. Cl.[5] H04N *5/14*
U.S. Cl. 358—140 **4 Claims**



1. A scaling method for use with interlaced video data, the video data having two fields, each field having a predetermined number of input lines, the method comprising the steps of:

receiving as input a scaling factor, expressible as a fraction having a numerator and a denominator, the numerator indicating the number of output lines for a predetermined number of input lines, the predetermined number of input lines equalling the denominator;

sequentially processing each successive input line;

counting from 1 to the denominator in steps of 1, the count resetting to 1 whenever the count is equal to the denominator, the count being incremented N times for each input line;

storing the input line in an output frame buffer and leaving one blank space in the output frame buffer if each of the two counts for the input line is less than or equal to the numerator;

storing the input line in a frame buffer and leaving no blank spaces in the frame buffer if the first count is equal to the numerator and the successive count is greater than the numerator and less than or equal to the denominator;

deleting the input line and leaving one blank space in the frame buffer if the first count is greater than the numerator and less than or equal to the denominator and the successive count is less than or equal to the numerator;

deleting the input line and leaving no blank spaces if the first and second count for the input line are both greater than the numerator and less than or equal to the denominator; and

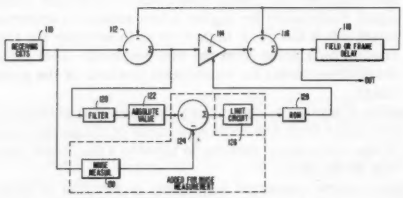
resetting the count to 2 when the second field is encountered, if the first input line in the first field was stored in the output frame buffer and, if the first input line in the first field was not put into the frame buffer, resetting the count to 1.

5,025,316

VIDEO NOISE REDUCTION SYSTEM WITH MEASURED NOISE INPUT

Ted A. Darby, Knoxville, Tenn., assignor to North American Philips Corporation, New York, N.Y.

Filed Nov. 6, 1989, Ser. No. 433,059
Int. Cl.[5] H04N *5/213*
U.S. Cl. 358—167 **3 Claims**



1. Television receiver apparatus, comprising:

receiving means for receiving a television signal having noise superimposed thereon and for furnishing a received television signal in response thereto;

first means connected to said receiving means for generating a noise signal varying, at least in part, in accordance with the amplitude of said superimposed noise;

second means connected to said receiving means for generating movement signals indicative, at least in part, of desired changes in said television signal resulting from actual changes in the television image; and

processing means, connected to said first means and said second means, for forming, in response to said noise signal and said movement signals, an output television signal having a noise content adjustably reduced from that in said received television signal, said processing means comprising a noise reduction circuit coupled to said second means for forming said output television signal with said noise content being adjusted in response to a control signal applied to a control input of said noise reduction circuit, and control signal generating means comprising subtraction means connected to said first means and said second means for subtracting said noise signal form said movement signals, an output of said subtraction means being coupled to said control input of said noise reduction circuit.

5,025,317

GHOST CANCELER USING REFERENCE SIGNALS TO GENERATE UPDATED CRITERION FUNCTIONS ON WHICH TAP GAINS ARE DETERMINED

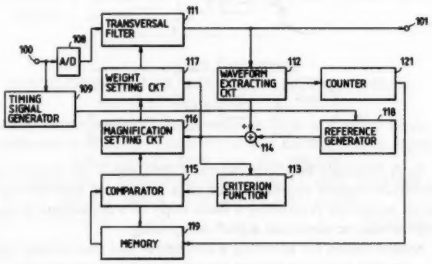
Tatsushi Koguchi, Iwai; Shigehiro Ito; Kazyuki Ebihara, both of Toride, and Yuji Nishi, Iwai, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Apr. 10, 1990, Ser. No. 506,834

Claims priority, application Japan, Apr. 13, 1989, 1-94227; Apr. 27, 1989, 1-49948[U]

Int. Cl.[5] H04N *5/21*

U.S. Cl. 358—167 1 Claim



1. A ghost canceler comprising:

a transversal filter filtering an input video signal with a filtering characteristic determined by tap gains;

a waveform extracting circuit extracting a waveform of a first ghost cancel reference signal contained in the input video signal;

a reference signal generator generating a second ghost cancel reference signal synchronous with the first reference signal;

a subtracter deriving a difference between the waveform of the first reference signal and a waveform of the second reference signal and generating a row of error signals representing the derived difference;

a criterion function setting circuit calculating a criterion function on the basis of the row of the error signals;

a memory storing a minimal value;

a comparator determining whether or not the criterion function currently calculated by the criterion function setting circuit is smaller than the minimal value stored in the minimal value;

means responsive to an output signal from the comparator for replacing the minimal value with the currently-calculated criterion function as a new minimal value when the currently-calculated criterion function is smaller than the minimal value, and for keeping the minimal value stored in the memory when the currently-calculated criterion function is not smaller than the minimal value;

a magnification setting circuit determining a magnification on the basis of the row of the error signals and the output signal from the comparator;

a weight setting means for calculating the tap gains on the basis of the magnification determined by the magnification setting circuit and the row of the error signals;

means for counting a number of times of execution of the extracting of the waveform by the waveform extracting circuit; and

means resetting the minimal value in the memory to a predetermined initial value when the number of times which is counted by the counting means reaches a predetermined number.

5,025,318

IMAGING APPARATUS WITH MEANS FOR CANCELLING DIFFERENTIAL OFFSET VOLTAGE

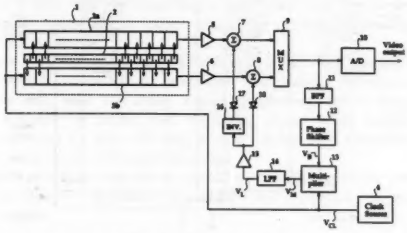
Riichi Nagura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 27, 1989, Ser. No. 457,901

Claims priority, application Japan, Dec. 27, 1988, 63-334826

Int. Cl.[5] H04N *3/14, 5/335, 5/213*

U.S. Cl. 358—213.15 18 Claims



1. A difference voltage canceller for a charge transfer device having a photosensor divided into odd- and even-numbered photosensitive elements, a first shift register connected to the odd-numbered photosensitive elements, and a second shift register connected to the even-numbered photosensitive elements, comprising:

means for generating bipolar clock pulses for driving said first and second shift registers;

detector means for generating a difference voltage representative of a difference between first and second offset voltages generated respectively by said first and second shift registers;

multiplier means for multiplying said difference voltage with said bipolar clock pulses;

filter means for smoothing a voltage output of said multiplier means; and

means for combining a voltage output of said filter means with one of the output signals of said first and second shift registers depending on the polarity of the voltage output of said filter means so that the difference between said offset voltages substantially reduces to zero.

5,025,319

SOLID STATE IMAGE PICKUP DEVICE DRIVING METHOD UTILIZING AN ELECTRONIC SHUTTER OPERATION

Hideki Mutoh, Kanagawa; Kazuya Oda, Tokyo, and Kazuhiro Kawajiri, Kanagawa, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 27, 1989, Ser. No. 371,783

Claims priority, application Japan, Jul. 12, 1988, 63-171879; Sep. 27, 1988, 63-239596

Int. Cl.[5] H04N *3/14*

U.S. Cl. 358—213.29 10 Claims

1. A method for driving a solid image pickup device comprising light receiving elements arranged in first and second fields, the elements being operatively connected to charge transfer paths in a light receiving section and a storage section, the storage section being operative to output its contents to a charge coupled device (CCD), comprising:

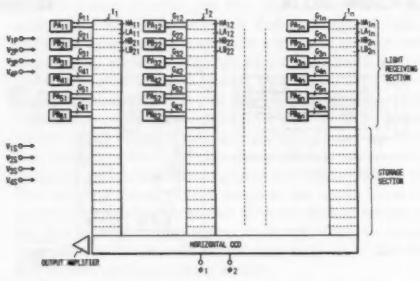
(a) transferring first signal charges produced by light receiving elements in said first field to charge transfer paths in said light receiving section and then to said storage section;

(b) transferring, while said first signal charges are held in said storage section, second signal charges produced by light receiving elements in said second field to said charge transfer paths in said light receiving section;

(c) outputting, while said second signal charges are held in said charge transfer paths of said light receiving section,

said first signal charges in said storage section through said CCD;

(d) utilizing a first time interval, which spans from the reception of light in said light receiving elements in said first field until the transferring of said first signal charges to said charge transfer paths, as a shutter period for said first field, and



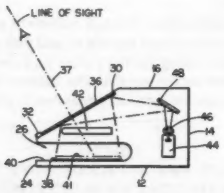
(e) utilizing a second time interval, which spans from the reception of light in said light receiving elements in said second field until the transferring of said second signal charges to said charge transfer paths, as a shutter period for said second field.

5,025,320

VIDEO IMAGING PODIUM

Henry Kyhl, Englewood, N.J., assignor to Buhl Industries, Inc., Fair Lawn, N.J.

Filed Sep. 7, 1989, Ser. No. 404,077
Int. Cl.[5] H04N *5/30, 7/18*
U.S. Cl. 358—229 **12 Claims**



1. A speaker's podium for use in boardrooms, meetings, training classes, auditoriums, and the like in conjunction with display of the speaker's illustrative materials, comprising:

an enclosure having a height that is lower than the speaker to permit an audience to view the speaker and being defined by a plurality of surfaces including a top surface, said top surface having a first opening therethrough and being spaced below eye level of the speaker;

at two-way mirror positioned in said first opening, a first side of said mirror being reflective, said first mirror side facing the interior of said enclosure, the second side of said mirror being at least partially transparent and facing outwardly of said enclosure;

support means being at least partially within said enclosure for supporting illustrative materials, said materials being visible to the speaker from outside of said enclosure by viewing directly through said two-way mirror when the speaker looks downwardly at the podium;

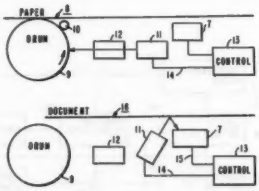
and camera means within said enclosure and positioned to receive light reflected from said illustrative materials by way of said reflective first mirror side when said illustrative materials are supported by said support means, all of the surfaces of the enclosure being spaced below eye level of a speaker to enable the speaker to have both an unobstructed view in a horizontal direction over said enclosure and an unobstructed view downwardly through said mirror when viewing from any position which is above the mirror.

5,025,321

FACSIMILE MACHINE USING THIN FILM ELECTROLUMINESCENT DEVICE

David Leksell, Oakmont; Zoltan K. Kun, Churchill Boro, and Juris A. Asars, Murrysville Borough, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 22, 1990, Ser. No. 527,213
Int. Cl.[5] H04N *1/028, 1/036, 1/29;* **G01D** *15/14*
U.S. Cl. 358—296 **24 Claims**



1. A facsimile machine having a read mode for producing electrical signals representative of a document and having a write mode for producing a fixed copy of a document from a representative electrical signal comprising:

sensor means for scanning a document and converting light images received into an electrical signal representative of such document;

photoreceptor means for forming a fixed copy from light images received; and

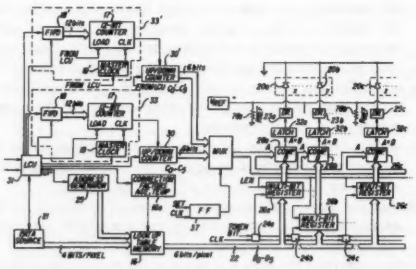
an edge emitting thin film electroluminescent line array containing a plurality of pixels for selectively directing at least a portion of light emitted from said pixels to said photoreceptor means when such facsimile machine is in a write mode thereby transmitting light images to said photoreceptor means and for selectively directing at least a portion of light emitted from said pixels to illuminate a document thereby providing light images to said sensor means when said facsimile machine is in a read mode.

5,025,322

METHOD AND APPARATUS FOR GREY LEVEL RECORDING USING MULTIPLE ADDRESSABILITY

Yee S. Ng, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 18, 1989, Ser. No. 453,421
Int. Cl.[5] H04N *1/21;* **G01D** *15/14*
U.S. Cl. 358—298 **27 Claims**



1. An apparatus for recording images upon an image receptor, the apparatus comprising:

a recording head having a plural number N of point-like

recording elements per inch extending so as to record along a line, the recording head emitting a line of dot recording emissions in response to data signals;

control means including means for providing data signals to the recording head for exposing M sub-lines per inch on the image receptor to record an image with a resolution of N×M dots per square inch, N and M being numbers greater than one and M being greater than N; and

wherein the control means further includes master clock means emitting pulses of first and second frequencies and means for controlling the duration of the emissions from the recording elements by controlling a recording element during one sub-line of recording in response to a plurality of pulses of the first frequency from the master clock means and controlling the same recording element during a next sub-line of recording in response to a plurality of pulses of the second frequency from the master clock means.

5,025,323

DEVELOPING UNIT SWITCHING DEVICE FOR A PRINTER

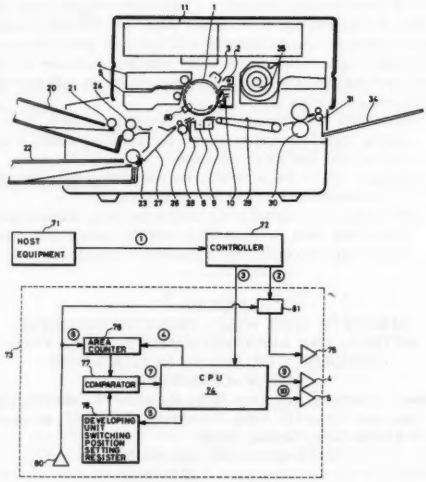
Kiyoshi Emori, and Hiroshi Maekawa, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jan. 23, 1989, Ser. No. 299,648

Claims priority, application Japan, Jan. 22, 1988, 63-13396

Int. Cl.[5] H04N *1/29;* **G03G** *15/01, 15/06*

U.S. Cl. 358—300 **11 Claims**



1. A printer for forming a printed image on a recording medium on the basis of data received from a host control unit, said printer comprising:

a photoreceptor member;

latent electrostatic image forming means provided opposed to said photoreceptor member for forming a latent electrostatic image on an outer periphery of said photoreceptor member;

first developing means provided opposed to said photoreceptor member in the downstream side of said latent electrostatic image forming means for developing a portion of said latent electrostatic image with toner of a first color;

second developing means provided in the downstream side of said first developing means for developing another portion of said latent electrostatic image with toner of a second color which is different from said first color;

pulse generating means associated with said photoreceptor member for generating pulses corresponding to an amount of rotation of said photoreceptor member;

counting means for counting said pulses, said counting means being adapted to start counting after start of formation of said latent electrostatic image;

setting means for setting a prescribed value based on the data received from the host control unit, said data representing a border line between the portions developed by the first developing means and developed by the second developing means;

switching signal generating means for generating a signal to switch operation of said first and second developing means, said switching signal generating means being adapted to output said switching signal when a value counted by said counting means reaches said prescribed value set by setting means; and

control means responsive to said switching signal for controlling the operation of said first and second developing means.

5,025,324

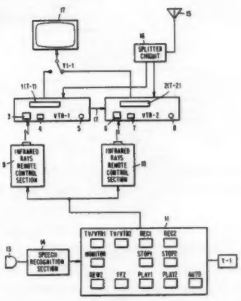
METHOD OF AND APPARATUS FOR RECORDING INFORMATION ON BOTH A MAIN RECORDING MEDIUM AND AN ENDLESS RECORDING MEDIUM FOR REPEATED EVENT MONITORING

Kazuo Hashimoto, Tokyo, Japan, assignor to Hashimoto Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 773,191, Sep. 6, 1985, abandoned. This application Jan. 9, 1989, Ser. No. 295,073

Int. Cl.[5] H04N *5/782*

U.S. Cl. 358—335 **6 Claims**



1. An audio/video information recording/playback apparatus with repeating monitor function and having an input means for receiving broadcast information, comprising:

means for performing a repeating recording operation of an endless type recording medium (T-1) which is composed of at least several seconds per cycle, and for performing a repeating playback operation thereof selectively in response to a control signal;

means for performing a recording or playback operation of a main recording medium (T-2);

means responsive to a first control signal generated by a remote control box for driving both said recording media (T-1 and T-2) simultaneously in a recording mode; and

control circuit means including

(a) first means operative in a first mode that is responsive to a second control signal generated by said remote control box for recording on said main recording medium (T-2) broadcast information received at said input means while causing a repeating playback of said endless type recording medium (T-1) so as to keep record-

ing said broadcast information on said main recording medium (T-2) without interruption; and

(b) second means operative in a second mode that is

(i) responsive to a third control signal generated by said remote control box for starting playback of said main recording medium (T-2) and, at the same time, setting said endless type recording medium (T-1) in the recording mode while said main recording medium (T-2) is used for playback so that information previously recorded by said main recording medium (T-2) can be recorded by said endless type recording medium (T-1),

(ii) responsive to a fourth control signal generated by said control box for causing temporary stopping of a driving operation of said main recording medium (T-2) at a temporary stopping position thereof while causing a repeating playback of said endless type recording medium (T-1), and

(iii) responsive to a fifth control signal generated by said remote control box for performing a playback operation of said main recording medium (T-2) from said temporary stopping position and at the same time switching said endless type recording medium (T-1) to the recording mode to record information previously recorded on said main recording medium (T-2).

5,025,325

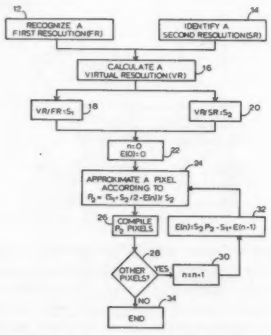
GRAPHICS SCALING METHOD FOR HIGH RESOLUTION PRINTERS

Kevin R. Hudson, Vancouver, Wash., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 13, 1989, Ser. No. 421,040

Int. Cl.[5] H04N *1/40*

U.S. Cl. 358—447 **12 Claims**



1. A method of scaling an image comprising:

recognizing such image as an arrangement of pixels at a first resolution of pixel positions;

identifying a second resolution of pixel positions, greater than the first resolution;

calculating a virtual resolution that is a multiple of the first and second resolutions and that may be expressed in arbitrary units;

approximating each pixel of such image at the first resolution as multiple pixels at the second resolution according to:

$$P_2=(S_1+S_2/2-E(n))/S_2$$

$$E(0)=0$$

$$E(n+1)=S_2P_2-S_1+E(n)$$

where P_2 is the number of pixels at the second resolution needed to approximate each pixel at the first resolution, S_1 is the number of virtual resolution units per first resolution position, S_2 is the number of virtual resolution units per second resolution position, and E(n) is a cumulative scaling error; and

compiling the P_2 pixels at the second resolution to create a scaled image.

5,025,326

FACSIMILE MACHINE USING CUT SHEETS AS RECEIVED-SIGNAL RECORDING PAPER AND METHOD OF FEEDING THE CUT-SHEETS

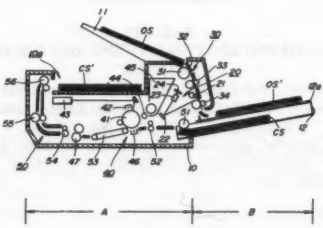
Takashi Shimmyo, Musashino, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 22, 1989, Ser. No. 411,002

Claims priority, application Japan, Sep. 30, 1988, 63-127102[U]

Int. Cl.[5] H04M *1/04*

U.S. Cl. 358—498 **10 Claims**



1. A sheet feeding method in a facsimile machine using cut sheets as received-signal recording paper and including a machine casing as a main frame of said facsimile machine and a recording paper cassette removably attached onto one side of said machine casing for containing the cut sheets, said method comprising the steps of:

sequentially introducing original document sheets from a casing installation zone where the machine casing is installed into interior of the casing;

reading a picture image written on one of the original sheets to be transmitted within the casing; and

discharging the original sheet having the image already read therefrom into a recording-cassette installation zone where said recording paper cassette is installed.

5,025,327

MAGNETIC DISK WRITE PRECOMPENSATION METHOD AND APPARATUS WHICH TAKES INTO ACCOUNT VARIATIONS IN HEAD/DISK CHARACTERISTICS

Jesse I. Stamness, Los Altos Hills; Raymond W. Morrow, San Jose, and Edward E. Asato, Sunnyvale, all of Calif., assignors to Unisys Corp., Detroit, Mich.

Filed Oct. 17, 1986, Ser. No. 920,004

Int. Cl.[5] G11B *5/09*

U.S. Cl. 360—45 **21 Claims**

1. A magnetic media storage system comprising:

controller means for providing control for said system;

a head/media assembly including a plurality of head/media combinations cooperating with said controller means for writing and reading digital data;

said assembly having media on which write precompensation data is recorded, said write precompensation data defining write precompensation characteristics for said head/media combinations taking into account performance differences among said head/media combinations;

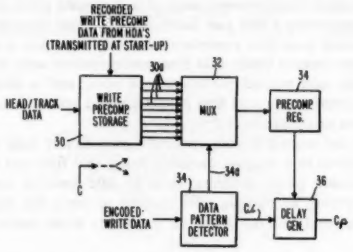
said controller means including read/write means for performing a writing operation on said media;

said controller means also including write precompensation means for providing write precompensation for said writing operation, said precompensation means having write

precompensation storage means for storing write precompensation data;

means for transferring the write precompensation data recorded on said media to said write precompensation storage means for storage therein prior to the performance of writing operations;

said write precompensation means being operative prior to the performance of a writing operation by a selected head/media combination for accessing from said write



precompensation storage means selected bit-shift write precompensation data corresponding to the selected head/media combination and also to the pattern of data to be written;

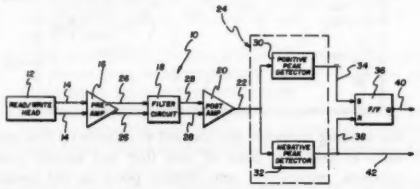
said read/write means being responsive to said selected bit-shift write compensation data to perform said writing operation in a manner which takes into account the selected head/media combination as well as the data pattern of the data to be written.

5,025,328

CIRCUIT FOR DECODING BINARY INFORMATION

Fernando G. Silva, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 22, 1989, Ser. No. 327,068
Int. Cl.[5] G11B *5/09*
U.S. Cl. 360—46 **6 Claims**



1. An electrical circuit suitable for decoding binary data comprising first and second information; which data has been encoded into an encoded signal, the encoded signal comprising:

(i) a succession of event-cells, each of which event-cells is demarcated by a pair of unique clock transitions; and wherein

(ii) each event-cell is dedicated to encoding either a first information or a second information; the electrical circuit comprising:

(1) a reading means for reading the encoded signal and producing a read signal which corresponds to a mathematical derivative of the encoded signal, so that the read signal comprises

a succession of event-cells, each of which event-cells comprises a unique pair of clock transition components, and each of which event-cells contains either a first information component represented by the substantial absence of a read signal in the event-cell or a second information component represented by the presence of a read signal in the event-cell;

(2) a detector means for interrogating the read signal and producing separate first and second output signals, wherein

(i) the first output signal comprises the succession of unique clock transition components, and

(ii) the second output signal comprises the first and second information components; and

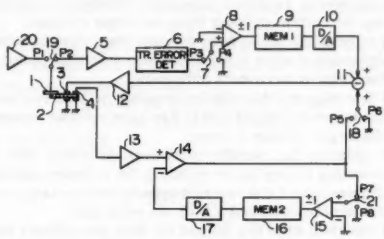
(3) bi-state means responsive to said first and second output signals for assuming during each event-cell either a first state in the absence of a read signal in the event-cell or a second state in the presence of a read signal in the event-cell, thereby mapping, in a one-to-one relationship, the succession of event-cells with the corresponding first or second information component dedicated in the encoding to each event-cell.

5,025,329

ELECTRONICALLY CONTROLLED MAGNETIC TAPE EDITING DEVICE

Hiroshi Taniguchi; Kanji Kubo, both of Hirakata, and Hiromi Nakase, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 26, 1989, Ser. No. 371,287
Claims priority, application Japan, Jun. 28, 1988, 63-160057
Int. Cl.[5] G11B *5/592*
U.S. Cl. 360—77.16 **3 Claims**



1. An electronically controlled magnetic tape editing device for a magnetic tape recorder/reproducer of helical scan type, comprising:

at least one magnetic head;

a first memory to store curvature information of a reproduced track derived from said magnetic head;

an electro-mechanical converting element which has said magnetic head mounted thereon and which is actuated in response to an output of said first memory;

a strain sensor for detecting mechanical strain in said electro-mechanical converting element;

a second memory for storing an output of said strain sensor for at least one reproduced track; and

an auxiliary circuit for actuating said electro-mechanical converting element to cause the output of said strain sensor in an editing recording operation to be coincident with the output of said strain sensor stored in the second memory while reproducing the track before an editing point in the tape,

wherein when said magnetic head is set for reproducing recorded tracks, both curvature information a nd the output of said strain sensor relating to the track before said editing point for a predetermined time period prior to the editing operation are stored respectively into said first memory and said second memory and when said magnetic head reaches said editing point, said magnetic head is set for recording new records to be edited onto the track.

5,025,330

HEAD POSITIONING CONTROL SYSTEM AND METHOD FOR A MEMORY DEVICE USING EVEN AND ODD TRACK CROSS PULSES

Takeshi Nishimiya, Cupertino, Calif., assignor to Fujitsu Limited, Kawasaki, Japan

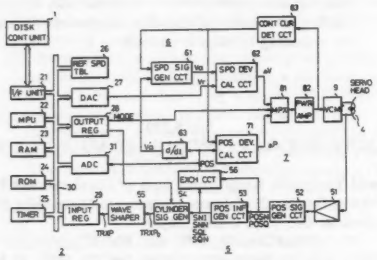
PCT No. PCT/JP88/00061, § 371 Date Sep. 27, 1988, § 102(e) Date Sep. 27, 1988, PCT Pub. No. WO88/05594, PCT Pub. Date Jul. 28, 1988

PCT Filed Jan. 27, 1988, Ser. No. 254,773

Claims priority, application Japan, Jan. 27, 1987, 62-16720

Int. Cl.[5] G11B *5/55, 21/08*

U.S. Cl. 360—78.04 **19 Claims**



18. A method for positioning a servo head from a current cylinder to a target cylinder of a memory storage device, comprising the steps of:

(a) calculating a cylinder movement difference by subtracting the current cylinder from the target cylinder;

(b) moving the servo head towards the target cylinder in dependence upon a predetermined reference speed and the cylinder movement difference;

(c) detecting an odd cylinder crossing by the servo head if the target cylinder is odd and an even cylinder crossing if the target cylinder is even;

(d) updating the cylinder movement difference after said detecting of step (c) by reducing the cylinder movement difference by 2 if the current cylinder and the target cylinder are both odd and if both are even; and

(e) repeating steps (b), (c) and (d) until the cylinder movement difference is equal to zero.

5,025,331

TAPE CASETTE LOADING SYSTEM COMPATIBLE WITH TWO DIFFERENT SIZED CASSETTES

Hiromichi Hirayama, Yokosuka; Mitsuhiko Hara, Kawasaki; Masato Mihara, Hiratsuka, and Mitsuo Harumatsu, Tokyo, all of Japan, assignors to Victor Company of Japan, Ltd., Kanagawa, Japan

Filed Nov. 9, 1988, Ser. No. 269,775

Claims priority, application Japan, Nov. 10, 1987, 62-282248

Int. Cl.[5] G11B *5/027*

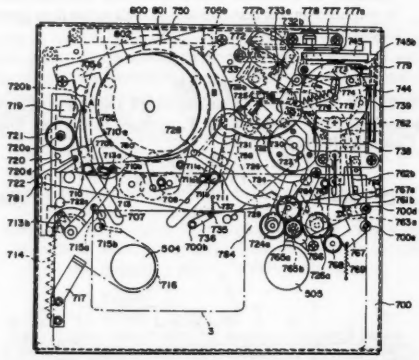
U.S. Cl. 360—85 **14 Claims**

1. A tape loading mechanism of a magnetic recording/reproducing apparatus for recording and/or reproducing an information signal on and from a magnetic tape contained in one of first and second tape cassettes which is held at a respective one of first and second predetermined positions in a body of the magnetic recording/reproducing apparatus, for loading and unloading the magnetic tape on a rotary drum means of the magnetic recording and reproducing apparatus on which magnetic heads for recording and reproduction of the infraction are carried, comprising:

a chassis fixed on the body of the magnetic recording/reproducing apparatus such that said first tape cassette having a first size and held at said first predetermined position in the body of the magnetic recording/reproducing apparatus is positioned above a first predetermined area defined on the chassis and that said second tape cassette having a second size substantially smaller than said first size and held at said second predetermined position in the body of the magnetic recording/reproducing apparatus is positioned above a second predetermined area of the chassis included in said first predetermined area, said chassis further carrying said rotary drum means at a position outside said first predetermined area;

first and second arcuate guide grooves respectively provided on said chassis with the rotary drum means being located therebetween, each of said arcuate guide grooves comprising a first part located outside said first predetermined area first predetermined area and said, a second part located inside said first predetermined area but outside said second predetermined area, and a third part located inside said first predetermined area and said second predetermined area;

first and second loading members respectively held on said chassis in a manner movable along said first and second arcuate guide grooves, each of said loading members carrying an oblique pole adapted to carry the magnetic tape and to wrap it around the rotary drum means when



the loading members are located at respective first positions in said first parts of said first and second guide grooves, respectively said oblique poles on the loading members being accepted in a depressed part at a front side of the first tape cassette which faces the rotary drum means when the first tape cassette is held at the first predetermined position in the body of a magnetic recording/reproducing apparatus and said first and second loading members are respectively located at second positions in said second parts of said first and second guide grooves, and said oblique poles on the loading members being accepted in a depressed part at a front side of the second tape cassette which faces the rotary drum means when the second tape cassette is held at the second predetermined position in the body of the magnetic recording/reproducing apparatus and said first and second loading members are respectively located at third positions in siad third parts of said first and second guide grooves; and

a motor driving means comprising a motor for moving said first and second loading members along said first and second guide grooves respectively between said first, second and third positions.

5,025,332
RECORDING-REPRODUCING SYSTEM HAVING MOVABLE REEL CHASSIS

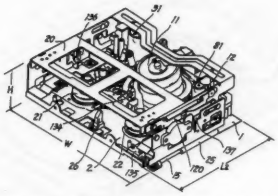
Takefumi Tsuchida, Kadoma; Minoru Yoshida, Neyagawa; Yoshimi Kodama, Kobe, and Masahiro Moriyama, Daito, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Aug. 29, 1989, Ser. No. 400,221

Claims priority, application Japan, Aug. 30, 1988, 63-215494; Aug. 30, 1988, 63-215495; Aug. 30, 1988, 63-215496; Aug. 30, 1988, 63-215497; Aug. 30, 1988, 63-215498; Aug. 30, 1988, 63-215499

Int. Cl.[5] G11B *5/027, 5/008*

U.S. Cl. 360—85 **11 Claims**



1. A recording-reproduction system settable in a standby mode and in a play mode, comprising:

a main chassis;

a head cylinder and a capstan disposed on said main chassis;

a movable reel chassis having a pair of reel supports, the reel chassis being movably supported on the main chassis having a head cylinder such that the reel chassis is movable toward or away from the head cylinder;

a rack supported by the movable reel chassis;

in the standby mode, a tape cassette supported on the reel chassis is disposed at a maximum distance away from the head cylinder, and in a play mode, signals are recorded or reproduced with the reel chassis positioned at a minimum distance from the head cylinder;

a loading motor supported on the main chassis;

a power shaft drivingly rotatable by the loading motor, the power shaft being rotatably supported on the main chassis and being axially movably supported on the main chassis;

a mode lever mounted on the main chassis and connected to an end of the power shaft such that the mode lever is pivotally movable in response to axial movement of the power shaft;

a worm gear fixed to the power shaft for rotation therewith, the worm gear being constantly in mesh with the rack mounted on the movable reel chassis;

a restraining mechanism disposed between the mode lever and the movable reel chassis for restraining the mode lever from pivotal movement during the movement of the movable reel chassis; and

a pinch roller pressing mechanism mounted on the movable reel chassis for pressing a magnetic tape against the capstan on the main chassis in response to pivotal movement of the mode lever.

5,025,333
TAPE ENGAGEMENT MECHANISM FOR MAGNETIC CASSETTE TAPE

Howard A. Feinberg, San Jose, and Theodore D. Rees, Mountain View, both of Calif., assignors to R-Byte, Inc., San Jose, Calif.

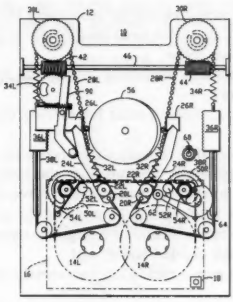
Filed Apr. 12, 1990, Ser. No. 508,344

Int. Cl.[5] G11B *15/665*

U.S. Cl. 360—85 **25 Claims**

1. Apparatus for extracting a magnetic tape from a cassette and positioning it proximately to a tape head for playback or recording, including:

symmetrical first and second tape engagement means for extracting said tape from said cassette and moving it along first and second tape engagement paths in a direction towards said tape head, said first and second tape engagement means including first and second end of travel stop means at either end of said first and second tape engagement paths for halting said first and second tape engagement means at predetermined stop positions, and



drive means for imparting motion to said tape engagement means, said drive means including anti-jamming means to prevent jamming said drive means in the event that one of said first and second tape engagement means arrives at its predetermined stop position before the other.

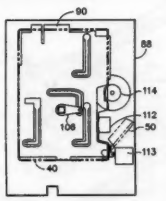
5,025,334
AUTO-LOADING TRANSPORT FOR TAPE CARTRIDGE WITH TAPE ACCESS DOOR AND BELT CAPSTAN ROLLER

Mark Perona; Tom C. Woller, both of San Diego, and Jon S. Guy, Carlsbad, all of Calif., assignors to Cipher Data Products, Inc., San Diego, Calif.

Filed Sep. 12, 1989, Ser. No. 405,932

Int. Cl.[5] G11B *5/008*

U.S. Cl. 360—96.5 **37 Claims**



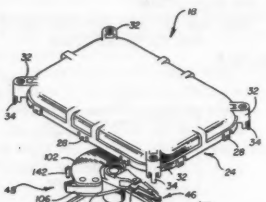
1. A transport for a rectangular tape cartridge having a length of six inches and a width of four inches, the cartridge further having a metal base plate, a plastic cover attached to the base plate and enclosing a pair of reels, a tape access door hingedly mounted between the base plate and the cover along a side edge of the cartridge, the access door being pivotable about and axis perpendicular to the base plate to open a cut-out region in the cover and thereby permit access to a length of tape which is windable between the reels by driving a belt capstan roller rotatably mounted along the side edge of the cartridge between the base plate and the cover, the transport comprising:

a frame dimensioned to fit within a rectangular enclosure measuring five and three-quarter inches in width and eight inches in length and to receive the cartridge therein;

a tray located inside the frame for receiving the cartridge endwise thereon so that the base plate of the cartridge is substantially parallel with a plane of the tray and the side edge of the cartridge is generally parallel to a longitudinal axis of the frame which coincides with the eight inch length dimension of the rectangular enclosure;

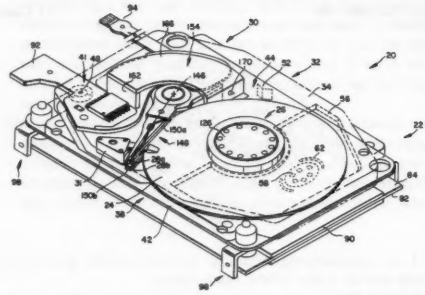
means connected to the frame adjacent the tray for opening the access door of the cartridge;
a read/write head;
means mounted to the frame adjacent the tray for supporting the read/write head for movement along a head reciprocation axis generally perpendicular to the base plate of the cartridge;
first electric motor means for selectively moving the read/write head along the head reciprocation axis;
a capstan drive roller;
means for rotatably mounting the capstan drive roller adjacent the tray;
second electric motor means for driving the capstan drive roller;
means for mounting the tray to the frame for movement in a direction generally transverse to the longitudinal axis of the frame to thereby transversely move the cartridge to engage the tape exposed by opening the access door with the read/write head and to engage the capstan drive roller with the belt capstan roller; and
third electric motor means for transversely moving the tray.

5,025,335
ARCHITECTURE FOR 2½ INCH DIAMETER SINGLE DISK DRIVE
Frederick M. Stefansky, Longmont, Colo., assignor to Conner Peripherals, Inc., San Jose, Calif.
Filed Jul. 31, 1989, Ser. No. 387,944
Int. Cl.[5] G11B *5/012*
U.S. Cl. 360—97.01 **19 Claims**



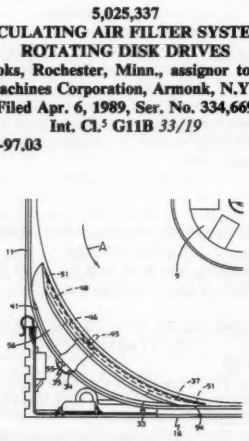
1. A two and one-half inch (2.5") form factor disk drive, comprising:
a base having a length approximately equal to the width of a three and one-half inch (3.5") form factor disk drive and a width approximately equal to one-half of the length of a 3.5" form factor disk drive;
a cover having the same dimensions as said base and engaged with said base to provide a controlled environment between said base and Baid cover;
control means for providing control signals;
storage means for storing data;
means provided on said base for rotating said storage means in response to the control signals; and
means for reading information from and writing information on said storage means in response to the control signals.

5,025,336
DISK DRIVE APPARATUS
James H. Morehouse, Jamestown; David M. Furay; John Biagaila, both of Boulder; F. Eugene Dion; Scott A. Shelstad, both of Longmont, and Jimmy L. Woods, Arvada, all of Colo., assignors to Prairietek Corporation, Longmont, Colo.
Filed Nov. 6, 1989, Ser. No. 432,664
Int. Cl.[5] G11B *33/14*
U.S. Cl. 360—97.02 **4 Claims**



1. An information storage apparatus, comprising:
a hard disk;
a spin motor for rotating said hard disk;
a transducer for communicating information with said hard disk;
a rotary actuator including arm means and motor means;
circuit means connected to said rotary actuator communicating with said transducer means;
housing means for housing said hard disk, said spin motor means, said transducer and said rotary actuator;
a printed circuit board;
electronic means located on said circuit board for controlling at least one of the following: said spin motor, said transducer and said rotary actuator;
means for connecting said housing to said printed circuit board in a stacked relationship wherein said information storage apparatus has a height no greater than approximately 0.630 inches.

5,025,337
RECIRCULATING AIR FILTER SYSTEM FOR ROTATING DISK DRIVES
Peter E. Brooks, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Apr. 6, 1989, Ser. No. 334,669
Int. Cl.[5] G11B *33/19*
U.S. Cl. 360—97.03 **5 Claims**



1. A magnetic disk drive having a plurality of disk media mounted as a disk stack for rotation in unison about a common

axis and a head-disk enclosure closely surrounding at least a portion of the periphery of said disk stack comprising

a baffle presenting a surface substantially concentric with and adjoining the periphery of said disk stack said baffle having a leading edge proximate to the periphery of said disk stack where said disks rotate toward said baffle;

an inlet opening between said baffle and said enclosure near said leading edge;

an outlet opening in said concentric baffle surface; and

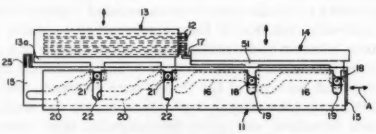
a filter medium mounted across said outlet opening, whereby a recirculating air filter path is established from said inlet opening to said outlet opening and through said filter medium.

5,025,338

AUTOMATIC DISC CARRYING AND PLAYING DEVICE

Toshiyuki Sone, Kanagawa; Takehiko Matsumoto, Ibaragi; Nobuya Omotezako, Kanagawa, and Keiji Kawasuji, Ibaragi, all of Japan, assignors to Car Mate Mfg. Co., Ltd., Tokyo, Japan

Filed Apr. 27, 1990, Ser. No. 515,118
Int. Cl.[5] G11B *15/68, 17/04*
U.S. Cl. 360—99.06 **6 Claims**



1. An automatic disk carrying and playing device in which individual disk trays are stored in stratified storage sections of a disk magazine, indentations formed in corners of each one of the disk trays adapted to engage with hooks on a disk carrier provided in a housing, a selected disk tray is carried to a disk read-out unit installed on a base frame by moving said hooks, and a disk tray of which a disk has been played is returned and stored in one of the storage sections of said disk magazine, wherein a pair of slide plates, which move back and forth in parallel with a direction in which said disk tray is drawn out and returned, are provided on said base frame, and each of said slide plates is provided with long lateral guide holes which support and guide said housing and stepped guide holes which support and guide said disk magazine so that:

said long lateral guide hole consists of:

an ascending guide part by which said housing is raised from a starting position to a position where said hooks are engaged with indentions on each one of said disk trays;

a horizontal guide part having a length corresponding to the number of disk trays housed in said disk magazine; and

a descending guide part along which a drawn out disk tray is lowered to a specified read-out position in said read-out unit; and

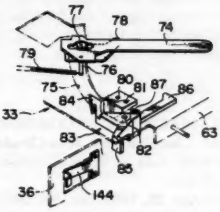
each of said stepped guides hole has a stepped guide part having steps which correspond in number to the number of disk trays in said disk magazine and a guide part which corresponds to said descending guide part along with one of said disk trays which is lowered to said read-out position of said read-out unit.

5,025,339

DISK DRIVE APPARATUS WITH OIL DAMPER ON EJECT LEVER

Tetsuo Kanno, Ebina; Yasushi Kotake, Machida, and Hitoshi Inada, Atsugi, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Division of Ser. No. 310,476, Feb. 13, 1989, abandoned, which is a division of Ser. No. 47,853, May 8, 1987, abandoned. This application Apr. 13, 1990, Ser. No. 511,987
Claims priority, application Japan, May 9, 1986, 61-105887
Int. Cl.[5] G11B *17/04*
U.S. Cl. 360—99.06 **4 Claims**



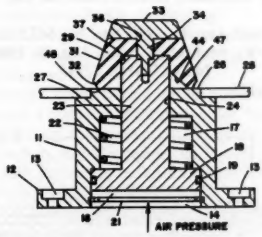
1. A disk drive apparatus comprising a tray (33) for receiving a disk device (130) loaded at a predetermined position therein, a movable eject arm (74) which is secured to said tray (33) and engages said disk device (130) loaded at said predetermined position in said tray (33), said disk device (130) having a movable shutter (133), said eject arm (74) being biased to exert an ejecting force on said disk device (130) loaded at said predetermined position in said tray (33), discharging means selectively permitting said disk device to be movable from said predetermined position in said tray under the biasing force exerted by said eject arm, a shutter opening and closing member (78) engaging and opening said movable shutter (133) of the disk device (130) as the disk device is being loaded at said predetermined position in said tray, and a damping mechanism (77) through which said shutter opening and closing member (78) is coupled to said movable eject arm (74).

5,025,340

ROTARY CHUCK FOR CENTERING AND RETAINING DATA DISCS

Roger Peters, 2260 American Ave., Hayward, Calif. 94545

Filed Oct. 16, 1989, Ser. No. 421,754
Int. Cl.[5] G11B *17/08*
U.S. Cl. 360—99.120 **9 Claims**



1. A chuck for releasably retaining a disc having first and second opposite surfaces and a central aperture extending therebetween, said chuck being comprised of:

an arbor extending along an axis of rotation and having a proximal end and a distal end, said arbor including at its distal end a coaxial neck portion dimensioned to be received through the central aperture of the disc, an annular land surface extending about said neck portion and dis-

posed to receive and seat a portion of said first surface of a disc which is to be retained by said chuck;

a deformable annular bushing disposed adjacent to said neck portion and being secured to said arbor in coaxial relationship therewith, said bushing having an annular sidewall portion formed of resilient material which expands radially in response to axial compression of said bushing, said bushing further having an annular edge at the periphery of said sidewall portion that contacts said neck portion of said arbor when said bushing is in an uncompressed condition and which edge increases in diameter to overlay and bear against an adjacent annular region of said second disc surface when said bushing is compressed, and

means for compressing said bushing in the axial direction to expand said annular edge of said bushing radially outward and onto said second surface of said disc thereby clamping said disc against said land surface.

5,025,341

THERMO-MAGNETIC RECORDING HEAD

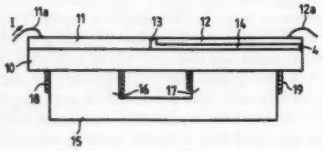
Philippe Bousquet, Chatillon, and Jean-Claude Lehureau, Ste-Genevieve-des-Bois, both of France, assignors to Thomson-Csf, Puteaux, France

Filed Apr. 25, 1989, Ser. No. 342,879

Claims priority, application France, Apr. 27, 1988, 88 05593

Int. Cl.[5] G11B *5/235*

U.S. Cl. 360—120 **23 Claims**



1. A magnetic head comprising:

a gap of a first material with magnetic properties at ambient temperature;

heating means to heat the material of the gap beyond the Curie temperature in order to make said gap material lose its magnetic properties; and

magnetic pole pieces of a second material on each side of the gap said pieces forming electrical conductors for conveying heating current to heat the gap material.

5,025,342

THIN-FILM MAGNETIC HEAD DEVICE FOR RECORDING AND REPRODUCING

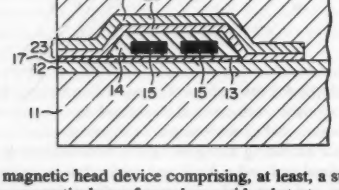
Yuji Nagata, Yao, and Toshio Fukazawa, Kyoto, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 15, 1990, Ser. No. 567,812

Claims priority, application Japan, Aug. 24, 1989, 1-218001

Int. Cl.[5] G11B *5/147*

U.S. Cl. 360—126 **6 Claims**



1. A magnetic head device comprising, at least, a substrate, a lower magnetic layer formed on said substrate, an upper magnetic layer which forms a magnetic gap at its one end adjacent to the surface of said lower magnetic layer for making sliding contact with a recording medium and a magnetic coupling at its other end, and a conductive coil which winds around the magnetic circuit formed by said lower and upper magnetic layers, wherein at least one of said lower and upper magnetic layers has a double-layered soft magnetic structure composed of two soft magnetic layers having different levels of coercive force, such that one of the soft magnetic layers which is located on the inner side of said magnetic circuit has a coercive force which is smaller than that of the other soft magnetic layer.

5,025,343

MAGNETIC HEAD CORE UTILIZING A NON-MAGNETIC LAYER

Shinzi Iida, Haguri; Fuminori Takeya, and Shinya Aoki, both of Nagoya, all of Japan, assignors to NGK Insulators, Ltd., Japan

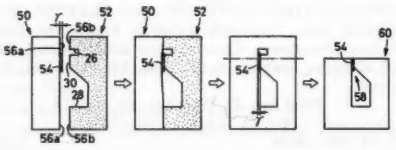
Division of Ser. No. 330,894, Mar. 31, 1989, Pat. No. 4,967,466.

This application Aug. 8, 1990, Ser. No. 564,186

Claims priority, application Japan, Mar. 31, 1988, 63-80135

Int. Cl.[5] G11B *5/133*

U.S. Cl. 360—127 **10 Claims**



1. A magnetic head core comprising:

a plurality of ferrite core elements bonded together through solid-solid reaction to form a substantially annular structure, wherein said structure has a magnetic gap of a predetermined width formed therein which is defined by two opposed portions of the ferrite core elements, said magnetic gap extending in a direction across the annulus of said structure; and p1 a non-magnetic layer consisting essentially of SiO or SiO_2 interposed between the opposed portions so as to define the predetermined width of said magnetic gap and for preventing an oxidation reduction reaction during the solid-solid reaction bonding of the ferrite core elements.

5,025,344

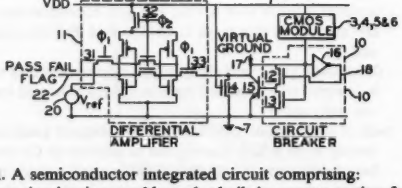
BUILT-IN CURRENT TESTING OF INTEGRATED CIRCUITS

Wojciech P. Maly, Pittsburgh, Pa., and Philip J. Nigh, Peekskill, N.Y., assignors to Carnegie Mellon University, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 277,352, Nov. 30, 1988, abandoned. This application Feb. 22, 1990, Ser. No. 483,569

Int. Cl.[5] H02H *3/16*

U.S. Cl. 361—88 **17 Claims**



1. A semiconductor integrated circuit comprising:

a main circuit assembly and a built-in current testing fault-detecting assembly on a unitary substrate;

said fault-detecting assembly being connected in circuit with

at least a portion of said main circuit assembly to detect the quiescent current flow through said integrated circuit portion a predetermined period after the application of timing signals to said built-in current testing fault-detecting assembly;

said fault-detecting assembly and integrated circuit portion being connected in series between local ground and the global ground of said integrated portion; and

said fault-detecting assembly being responsive to abnormal quiescent current flow through said integrated circuit portion while ignoring normal high operational currents in said integration circuit during the timing period as an indication of defects within said integrated circuit portion;

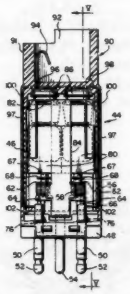
whereby the speed of said fault detecting assembly matches the circuit under test.

5,025,345

OVERLOAD PROTECTOR MODULE AND BUILDING ENTRY PROTECTOR WITH INTEGRALLY MOLDED MODULAR JACK

Robert J. Marks, Carpentersville, Ill., assignor to Northern Telecom Limited, Montreal, Canada

Filed Feb. 24, 1987, Ser. No. 18,290
Int. Cl.[5] H02H *3/22*
U.S. Cl. 361—119 **12 Claims**



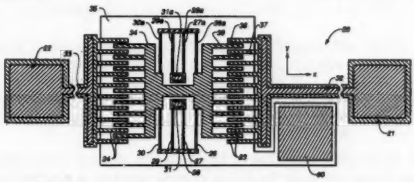
1. An overvoltage protector module comprising a housing having a base; a first pair of line terminals and a ground terminal in the base; a modular jack provided upon the housing in a position remote from and on the opposite side of the housing from the base, a second pair of line terminals provided by the modular jack with the terminals of the second pair connected, one in circuit with each of the terminals of the first pair; a third pair of line terminals connected one in circuit with each of the terminals of the first pair, the terminals of the third pair extending from the base; a current overload protection unit located in series between each terminal of the first pair and the corresponding in-circuit terminal of the second pair and in series between each terminal of the first pair and the corresponding in-circuit terminal of the third pair; and an overvoltage protection unit means inside the housing, the overvoltage protection unit means having two first electrode means, electrically connected one to each terminal of the first pair, the overvoltage protection unit means also having second electrode means spaced apart from each of the first electrode means to define a gap with each of said first electrode means, the second electrode means electrically connected to the ground terminal.

5,025,346

LATERALLY DRIVEN RESONANT MICROSTRUCTURES

William C. Tang, Emeryville, and Roger T. Howe, Lafayette, both of Calif., assignors to Regents of the University of California, Oakland, Calif.

Filed Feb. 17, 1989, Ser. No. 312,642
Int. Cl.[5] H01G *7/00*; G01P *15/08*
U.S. Cl. 361—283 **20 Claims**



10. A resonant microstructure for use as a sensor or an actuator, including in combination:

a silicon substrate,

a movable plate, suspended above and anchored to such substrate, and

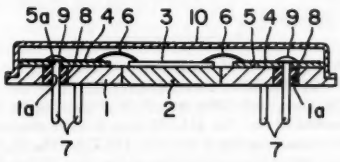
lateral-drive means for driving said plate electrostatically in a plane parallel to and above said substrate.

5,025,347

SEMICONDUCTOR DEVICE

Masamichi Shindo; Toshiharu Sakurai; Hideo Taguchi, and Nobu Izawa, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 11, 1989, Ser. No. 336,429
Claims priority, application Japan, Apr. 13, 1988, 63-90855
Int. Cl.[5] H05K *7/20*
U.S. Cl. 361—386 **3 Claims**



1. A semiconductor device comprising:

a metal stem having a planar shape and a plurality of through holes, and being made of metal having a coefficient of thermal expansion αs;

a printed circuit board having wiring patterns on its upper surface and a plurality of through holes, being made of a material having a maximum coefficient αp in the widthwise direction, and being superposed over the upper surface of said metal stem to form a lamination, said lamination having a maximum width (L);

a plurality of lead pins having upper portions inserted into said through holes of said stem and board which are in alignment with each other when said board and said stem are superposed one upon another; and

connecting members for connecting said upper portions of said lead pins with corresponding wiring pattern;

wherein an absolute value $\Delta\alpha$ of the difference between said maximum coefficient αp of said board and said coefficient αs of said stem ($\Delta\alpha = \alpha p - \alpha s$) is less than or equal to about "$1.52 \times 10^{-4}/L$" ($\Delta\alpha \leqq 1.52 \times 10^{-4}/L$).

5,025,348

BONDING STRUCTURE OF AN ELECTRONIC DEVICE AND A METHOD FOR MANUFACTURING THE SAME

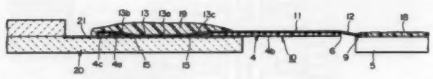
Satoshi Suzuki; Osamu Kuwabara; Jiro Muto, and Eiichi Shinozaki, all of Tokyo, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Nov. 14, 1988, Ser. No. 272,136

Claims priority, application Japan, Nov. 20, 1987, 62-292151; Apr. 20, 1988, 63-95448

Int. Cl.[5] H05K *1/00*

U.S. Cl. 361—398 18 Claims



1. A bonding structure of an electronic device, comprising:

an insulating sheet having a central portion, a side portion and a connecting opening defined by said central portion and side portion;

an electronic device having a plurality of electrodes arranged at a side edge thereof;

a plurality of electrically conductive metal leads carried on at least one surface of said insulating sheet, said electrically conductive metal leads having ends electrically connected to said electrodes of said electronic device at said central portion of said insulating sheet and having in the vicinity of other ends thereof connecting portions which are received in said connecting opening, said other ends being carried by said side portion of said insulating sheet, said connecting portions being deformed so as to have a level part facing to the other surface of said insulating sheet and two inclined parts adjacent to said level part, said inclined parts rising up towards the upper edge of a wall of said central portion and side portion of said insulating sheet;

a plurality of connecting terminals facing said connecting portions of said metal leads, respectively; and

soldering layers for bonding said connecting portions of said metal leads and said connecting terminals to each other, each of said soldering layers including two pools which increase a thickness of a layer along said inclined parts of said metal leads.

5,025,349

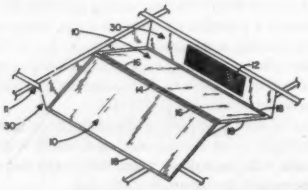
EMERGENCY LIGHTING FIXTURE

Thomas W. Gow, 1039 109th Ave. N.W., Coon Rapids, Minn.

Continuation of Ser. No. 241,353, Sep. 8, 1988, abandoned, which is a continuation of Ser. No. 159,274, Feb. 23, 1988, abandoned, which is a continuation of Ser. No. 75,512, Jul. 20, 1987, abandoned. This application Aug. 4, 1989, Ser. No. 389,629

Int. Cl.[5] F21V *19/04*

U.S. Cl. 362—20 5 Claims



1. An emergency lighting fixture for actuation when power to a primary lighting system in a room is lost, comprising:

(a) a panel mounted in a ceiling of the room for movement between a normal, retracted position, and an extended position, said panel having a first edge defining an axis with respect to which said panel is disposed for pivoting, and wherein, when said panel is in said retracted position, said panel is flush with the ceiling, and wherein, when said panel is in said extended position, said panel is pivoted downwardly about said axis, and wherein said panel has a second edge opposite said first edge and a platen intersecting said panel generally perpendicularly along said second edge, said platen having a generally horizontally extending slot formed therein;

(b) means, when power to the primary lighting system is uninterrupted, for maintaining said panel in said retracted position, and, when power to the primary lighting system becomes interrupted, for moving said panel to said extended position, said means for maintaining and moving comprising;

(i) a shaft having a main portion defining an axis of elongation, and a distal portion, spaced radially from said axis of elongation, said shaft being disposed for movement wherein said main portion thereof rotates about said axis of elongation between a first position, wherein said distal portion is angled away from a directly downwardly extending orientation, and a second position, wherein said distal portion is rotated downwardly from said first position, said distal portion being received in said slot formed in said platen; and

(ii) means for orienting said main portion of said shaft in said first position thereof when power to the primary lighting system is uninterrupted, and for rotating said main portion of said shaft to said second position thereof when power to the primary lighting system becomes interrupted;

(c) a lamp mounted on said panel, said lamp projecting generally perpendicularly to said platen; and

(d) means, when said panel is in said extended position, for energizing said lamp.

5,025,350

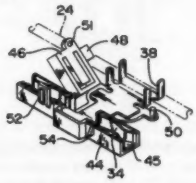
VEHICLE CLEARANCE LAMP ASSEMBLY

Alfred G. Tienken, Syracuse, N.Y., assignor to Federal-Mogul Corporation, Southfield, Mich.

Filed Apr. 25, 1990, Ser. No. 514,480

Int. Cl.[5] H01R *4/24*

U.S. Cl. 362—61 14 Claims



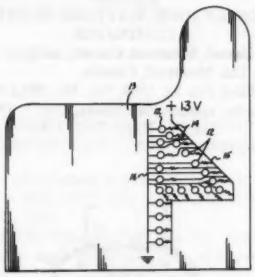
1. A bulb lamp assembly of the type adapted to be fixed on a pair of conductors and releasably snapped into a housing which comprises:

a first conductive connector plate having at least one bulb receptacle member and at least one conductor receptacle member arranged at opposite ends thereof;

a non conductive housing for said plate adapted to hold and insulate said plate, said housing having a hinged clamping tab and a locking stud adapted to capture a conductor within said conductor receptacle when said tab and stud are engaged to secure said conductor mechanically and electrically in said conductor receptacle,

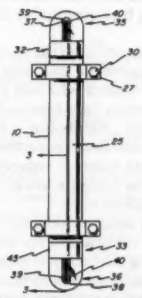
said non-conductive housing having an alignment stud and a latch bail and striker adapted to mate with a corresponding latch bail and striker of another identical housing when a pair of said housings are engaged in face to face mating relationship so that a pair of plates are connected to a pair of conductors to form at least one receptacle for a lamp.

5,025,351
ILLUMINATED SPLASH GUARD
Greg L. Martin, 2125 Glouchester Ave., Columbus, Ohio 43229-1514
Filed Mar. 15, 1990, Ser. No. 493,633
Int. Cl.[5] B60Q *1/00*
U.S. Cl. 362—83 3 Claims



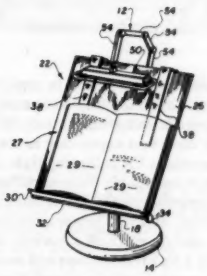
1. An illumination member comprising, in combination,
a flexible splash guard including a forward surface spaced from a rear surface, and
the forward surface including a matrix of light emitting diodes mounted thereon for creating a message on the forward surface, and
a negative transmission line, and a positive transmission line directed interiorly of the splash guard between the forward surface and the rear surface to effect illumination of the light emitting diodes, and
wherein a rectangular matrix of apertures are directed through the forward and the rear surface of the splash guard in electrical communication with the electrical transmission lines, and a snap-on illumination member selectively mounted in selective ones of the matrix of apertures for securement of the illumination member thereon, and for electrical communication therewith and the illumination member including the light emitting diodes mounted thereon.

5,025,352
LIGHTED GRAB HANDLES FOR TRUCKS
Thomas H. Brown, 716 W. Bogart Rd., Sandusky, Ohio 44870
Filed Jun. 11, 1990, Ser. No. 536,361
Int. Cl.[5] B60Q *1/32*
U.S. Cl. 362—83.3 17 Claims



1. A grab handle for use on motor vehicles comprising
a generally vertically extending gripping portion,
means for attaching said gripping portion to the side of a motor vehicle, and
lamp means in at least one end of said handle for indicating the position of said vehicle, said lamp means including first and second lamp filaments, said first lamp filament connected to the electrical circuitry of the vehicle responsible for supplying power to the running lamps of the vehicle, said second lamp filament connected to the electrical circuitry of the vehicle responsible for supplying power to the turn signals of the vehicle.

5,025,353
ADJUSTABLE READING STAND AND LIGHT ASSEMBLY
David L. Menaged, 12260 SW. 40th St., Miami, Fla. 33175
Filed Mar. 12, 1990, Ser. No. 492,074
Int. Cl.[5] A47B *19/00*
U.S. Cl. 362—98 17 Claims



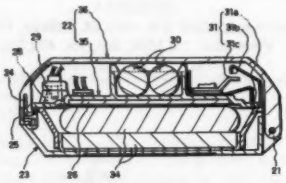
1. A light assembly for use in combination with a reading stand comprising:
said reading stand including a support platform configured for mounting on a supporting surface and a support arm secured thereto and extending upwardly therefrom,
said reading stand further including a copy holder having a substantially planar configuration and attached to and adjustably positionable on an outer end of said supporting arm,
said copy holder including a support plate mounted on lower end thereof and extending outwardly therefrom into supporting relation to a copy positioned on an outer exposed surface of said copy holder,
a stop plate pivotally mounted to said lower end of said copy holder and angularly adjustable relative thereto in retaining position relative to lower ends of the copy disposed on said outer exposed surface,
adjustment ;means mounted on said copy holder and movably interconnecting said stop plate to said lower end of said copy holder for adjustable, angular retaining orientation of said stop plate relative to the lower ends of the copy disposed on said outer exposed surface,
said light assembly including a base assembly mountable adjacent to said copy holder and structured to house a control means for activating and powering a light associated with said light assembly,
mounting means secured at least in part to an under surface of said copy holder and structured to removably support said base of said light assembly thereon,
a support member having an end connected to said base and extending outwardly therefrom into supporting attachment with a light housing at an opposite end thereof relative to said base,
said support member and said light housing adjustably connected and selectively positionable relative to said outer exposed surface and copy thereon, and
a conductor means movably attachable to said base and said control means therein for connection from said control means to a source of electrical power.

5,025,354

COMPACT HAVING AN ILLUMINATOR

Yoshio Kondo, Paradion Sugaguchi 501, 1-26 Sugaguchi Ekimae, Shinkawacho, Nishikasugai District, Aichi Prefecture, Japan

Filed Jun. 1, 1990, Ser. No. 531,875
Claims priority, application Japan, Dec. 26, 1989, 1-149956[U]; Mar. 9, 1990, 2-23918[U]
Int. Cl.[5] F21V *33/00*
U.S. Cl. 362—135 2 Claims



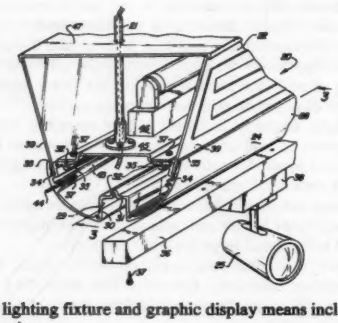
1. An illuminated compact for use in applying cosmetics to a user's face, operable automatically on opening and closing the compact, said compact comprising a body formed of an upper case and a lower case, said upper case having an illuminating lamp, a reflecting means for collecting light emitted from said lamp, and a light transmittable element diffusing the collected light, said light transmittable element irradiating said light onto the face of the user, and said lower case having a place for accommodating one or more of a variety of cosmetics, said upper case having a removable cover and an automatic switch, a battery, and a manual switch placed therein, said manual switch comprising a cylinder rotatable by manually rotating a knob and having an insulating portion for interrupting an electrical current, and an electrode plate, one end of which is coupled to the battery and the other end of which is coupled to said rotatable cylinder.

5,025,355

COMBINATION LIGHTING FIXTURE AND GRAPHIC DISPLAY MEANS

Ronald P. Harwood, 31110 Applewood, Farmington Hills, Mich. 48018

Filed Nov. 3, 1989, Ser. No. 431,292
Int. Cl.[5] F21S *1/02*
U.S. Cl. 362—147 25 Claims



1. A lighting fixture and graphic display means including, in combination:

(a) a fixture body of a desired shape and cross-section,

(b) a pair of slots formed in said fixture body proximate the upper longitudinal edges thereof,

(c) a pair of support shelves formed in said fixture body adjacent said slots,

(d) a raceway cover extending between and connected to said support shelves to form a hollow raceway within said fixture body,

(e) a light source mounted to said raceway cover, and

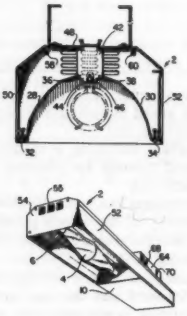
(f) upwardly extending graphic display means mounted in said slots in a position to receive light directly from said light source.

5,025,356

SMALL PROFILE HIGH WATTAGE HORITCULTURAL LUMINAIRE

Mahmoud A. Gawad, Montreal, Canada, assignor to GET Sylvania Canada Ltd, Montreal, Canada

Filed Jul. 31, 1989, Ser. No. 388,179
Claims priority, application Canada, Oct. 7, 1988, 579557
Int. Cl.[5] F21V *7/12, 7/16*
U.S. Cl. 362—221 5 Claims



1. A luminaire having an adjustable photometric distribution comprising:

a housing including a first compartment for containing a lamp, said first compartment having an open underside;

a first plate member mounted on said housing, said first plate member having first and second sides, said first side defining one end of said first compartment, a socket for said lamp being mounted on said first side of said first plate member;

a second plate member mounted on said housing spaced from said first plate member, said second plate member having first and second sides, there being a second compartment extending from said second side of said first plate member to said first side of said second plate member;

a ballast unit for said lamp mounted in said second compartment and making heat-conductive contact with said housing;

a third plate member covering the open underside portion of said second compartment, said third plate member making heat-conductive contact with said ballast unit;

a reflector for reflecting light from said lamp with an adjustable photometric distribution, said reflector being mounted within said first compartment above the position for said lamp, said reflector comprising two flexible sections, each section having a lower longitudinal edge and an upper longitudinal edge;

a reflector support member mounted within said first compartment above the position for said lamp, said support member including first support means for supporting the upper longitudinal edge of said first reflector section in a plurality of mounting positions and second reflector support means for supporting the upper longitudinal edge of said second reflector section in a plurality of mounting positions;

said first reflector section being mounted with its upper longitudinal edge supported in a selected upper mounting position by said first support means and said second reflec-

tor section being mounted with its upper longitudinal edge supported in a selected upper mounting position by said second reflector support means such that the shape of said first flexible reflector section is adjusted by its selected upper mounting position, the shape of said second flexible reflector section is adjusted by its selected upper mounting position, and the photometric distribution of said luminaire is adjusted by said upper mounting positions of said first and second reflector sections.

5,025,357

SUSPENDED ELECTRIC LAMP

Ingo Maurer, Kaiserstrasse 47, 8000 Muenchen 40, Fed. Rep. of Germany

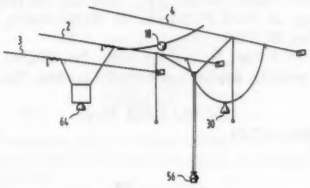
PCT No. PCT/EP85/00485, § 371 Date May 19, 1986, § 102(e) Date May 19, 1986, PCT Pub. No. WO86/01872, PCT Pub. Date Mar. 27, 1986

PCT Filed Sep. 18, 1985, Ser. No. 876,853

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1984, 3434410

Int. Cl.[5] F21V *21/00*

U.S. Cl. 362—249 **6 Claims**



1. A suspended electric lamp comprising:

a light source;

two tensioned lead-in wires fed with low voltage;

two conducting wires, each having a first and second end, said conducting wires, supporting and serving as a power supply for said light source, said conducting wires being substantially flexible at least at said first ends thereof, said first ends of said conducting wires being each releasably connected to one of said two tensioned lead-in wires; and

said first ends of said flexible conducting wires are wound around said lead-in wires.

5,025,358

DUST RESISTANT ELECTRIC LIGHT FIXTURE

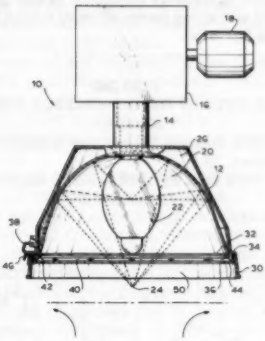
Timothy A. Cannell, Kirkwood, Mo., assignor to Guth Lighting Inc., St. Louis, Mo.

Filed May 18, 1990, Ser. No. 525,916

Int. Cl.[5] F21V *29/00*

U.S. Cl. 362—267 **6 Claims**

1. An electric light fixture comprising a lamp head having an open end, a bulb in said head, an elliptically shaped reflector in said head, said bulb being located at one focus of the elliptical shape of the reflector for focusing light from said bulb at the other focus of the elliptical shape, a transparent lens positioned across said open end of said head between said foci of the elliptical shape closer to the focus at which said light is focused, whereby heat from the lamp is focused and concentrated beneath and near said lens to heat the air adjacent the lens to temperatures sufficient to create a substantial static-air barrier layer adjacent the lens, and an extension ring removably mounted on said open end of said head and extending away from said head and lens thereby to trap the air heated by the focused light adjacent said lens and within the space defined by said ring below said lens whereby dust particles are



deflected away from said lens by convection air flow and fall away from said lens when they do manage to get into the layer.

5,025,359

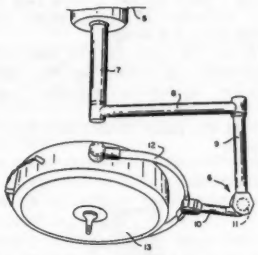
COUNTERBALANCED ARM FOR A LIGHTHEAD

Raja Saluja, and Arthur T. Nagare, both of Erie, Pa., assignors to American Sterilizer Company, Erie, Pa.

Filed Mar. 16, 1990, Ser. No. 495,248

Int. Cl.[5] F21V *21/15*

U.S. Cl. 362—402 **7 Claims**



2. A counterbalanced arm for a lighthead, comprising:

an upper arm portion;

a lower arm portion adapted at one end to be connected to the lighthead and at the other end for articulation about said upper arm portion;

pivot means connecting said upper arm and said lower arm portion, said pivot means defining a pivot axis about which said lower arm portion pivots with respect to said upper arm portion;

lever means having a first end positioned on one side of said pivot axis and a second end positioned on said other side of said pivot axis, said lever means having an arcuate shaped link, said lever means additionally having an auxiliary link having a first end pivotally connected to one of said upper and lower arm portions and a second end pivotally connected to one end of said arcuate shaped link, said auxiliary link operative to extend the moment arm of said lever means to enable the counterbalanced arm to counteract the weight of the lighthead when said lower arm portion forms an acute angle with said upper arm portion, said arcuate shaped link having a sufficient arc to enable said lower arm portion to pivot about said pivot axis from a position forming an acute angle with respect to said upper arm portion to a position forming a 180 degree angle with said upper arm portion;

pull rod means positioned within the one of said upper and lower arm portions which is not connected to said first end of said auxiliary link and pivotally attached to said second end of said lever means;

spring means operatively connected to said pull rod means such that said spring means provides a force to counterbalance the lighthead.

5,025,360

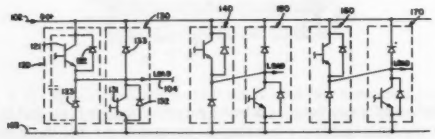
INVERTER SWITCH WITH PARALLEL FREE-WHEEL DIODES

Thomas S. Latos, Huntley, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 20, 1989, Ser. No. 453,751

Int. Cl.[5] H02M *3/335*

U.S. Cl. 363—16 **7 Claims**



1. A module of components grouped physically close to each other, comprising a transistor, an antiparallel diode connected across said transistor, and a series diode connected in series with said transistor, the primary directions of conductance of said transistor and said series diode being in opposition.

5,025,361

WATERING CONTROL SYSTEM

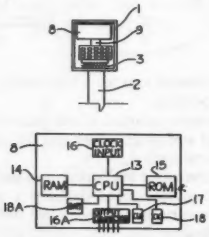
John L. Pitman, 4 Sixth Avenue, Glenelg East Adelaide 5000, and Kyn A. McCauley, 15 Ferry Avenue, Plympton Park Adelaide 5000, both of Australia

Continuation of Ser. No. 6,677, Dec. 15, 1986, abandoned. This application Aug. 3, 1989, Ser. No. 390,475

Claims priority, application Australia, Apr. 15, 1985, PH00142

Int. Cl.[5] G06F *15/46*; G05D *7/06*

U.S. Cl. 364—143 **15 Claims**



15. An apparatus for controlling a plurality of outputs for an irrigation system comprising,

a basic unit including a plurality of off/on controllers, and prompting module to control said off/on controllers,

said off/on controllers being connected to selectively operable output control devices used to supply an irrigation fluid,

said prompting module comprising a central processing unit, clock means interfacing with said central processing unit for providing timing information for controlling the operation of said central processing unit, and memory means interfacing with said central processing unit to provide program information to said central processing unit to operate said off/on controllers,

said prompting module being separable from said basic units and coupled thereto by output connecting means which enables communication between said prompting module and said basic unit for control of said off/on controllers,

said separable prompting module being removable from said basic unit and able to be coupled to an interfacing port of a computer by means of said output connecting means so as to communicate with an interface adapter within said computer, wherein said interface adapter may be configured for two-way communication such that said memory means in said prompting module may be reprogrammed by means of said computer.

5,025,362

COORDINATE POSITIONING SYSTEM

Alan D. Darlington, Dursley, United Kingdom, and Kevin P. Waggitt, Etobicoke, Canada, assignors to Renishaw plc, Gloucestershire, United Kingdom

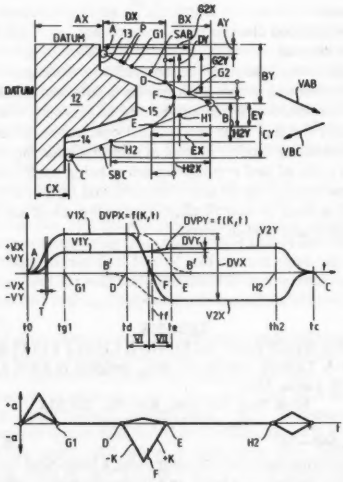
PCT No. PCT/GB87/00787, § 371 Date Aug. 10, 1988, § 102(e) Date Aug. 10, 1988, PCT Pub. No. WO88/03672, PCT Pub. Date May 19, 1988

PCT Filed Nov. 6, 1987, Ser. No. 216,541

Claims priority, application United Kingdom, Nov. 8, 1986, 8626734

Int. Cl.[5] G05B *19/41*

U.S. Cl. 364—167.01 **20 Claims**



5. A method of operating a coordinate positioning machine to accelerate a head of the machine, the method comprising the steps of:

determining, on the basis of first and second velocities and a predetermined acceleration function, a time interval required to accelerate the head from the first to the second velocity;

determining on the basis of the time interval a curved velocity profile for accelerating the head from the first to the second velocity; and

driving the head according to the curved velocity profile.

5,025,363

AUTOMATIC PROGRAMMING METHOD

Masaki Seki; Takashi Takegahara, both of Tokyo, and Masatoshi Nakajima, Yamanasshi, all of Japan, assignors to Fanuc Ltd., Yamanashi, Japan

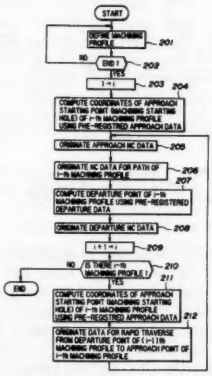
PCT No. PCT/JP88/00704, § 371 Date Mar. 7, 1989, § 102(e) Date Mar. 7, 1989, PCT Pub. No. WO89/00475, PCT Pub. Date Jan. 26, 1989

PCT Filed Jul. 15, 1988, Ser. No. 320,091

Claims priority, application Japan, Jul. 16, 1987, 62-178091

Int. Cl.[5] G05B *19/403*

U.S. Cl. 364—191 **8 Claims**



1. An automatic programming method involving NC program data for wirecut electric discharge machining, comprising the steps of:

(a) presetting data for specifying an approach path, a departure path and wire-cut electric discharge machining conditions;

(b) successively setting two or more machining profiles; and

(c) creating, for each of said machining profiles and after step (b), approach NC data, NC data for moving a wire electrode along the machining profile, and departure NC data using the machining profile and said preset data.

5,025,364

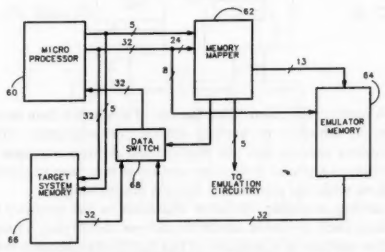
MICROPROCESSOR EMULATION SYSTEM WITH MEMORY MAPPING USING VARIABLE DEFINITION AND ADDRESSING OF MEMORY SPACE

Joel A. Zellmer, Colorado Springs, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 29, 1987, Ser. No. 67,987

Int. Cl.[5] G06F *9/355, 9/455, 12/02, 7/02*

U.S. Cl. 364—200 **3 Claims**



3. An emulation system for emulating a user-defined microprocessor-based target system having a target microprocessor for executing the target system, a target memory wherein target system information is stored in relation to target memory address information, and a target input/output port, the system comprising:

emulation support means for receiving user compounds, for accessing the target system to determine internal target system values, and for emulating a user-defined microprocessor-based target system;

microprocessor means connected to the emulsion support means for controlling the emulation support means in response to received user commands;

emulation memory means connected to the microprocessor means for emulating a target memory defined in the target system; and

memory mapper means connected to the emulation support means, the microprocessor means, and the emulation memory means, for receiving the target memory address information, for defining and mapping memory blocks in the emulation memory means in relation to the target memory address information and for storing information in the emulation memory means in relation to the defining and mapping of memory blocks, wherein said memory mapper means comprises:

a plurality of definition means, each having a plurality of address inputs, a plurality of definition inputs, a plurality of address outputs, and a control output, for defining individual blocks of memory, wherein each definition means operates in parallel to all other definition means in the system,

wherein the address inputs for each definition means are identical, the address outputs for each definition means are ORed together, the control outputs for each definition means are ORed together, and wherein each definition means comprises:

range comparator means connected to the address inputs, the definition inputs, and the control output, for determining whether the address on the address inputs is outside a range defined by an upper and lower user-defined limit whereby a comparator means result is produced and for signaling the comparator means result on the control output, said range comparator means comprising definition comparator means for determining whether the definition inputs are identical to a user defined definition,

translator means connected to the address inputs and the definition inputs, for adding a user-defined offset to the address on the address inputs whereby a translator means result is produced, and

buffer means connected to the range comparator means and the translator means and the address output, for placing the translator means result on the address output only when both the range comparator means determines the address is not outside the defined range and the definition comparator means determines the definition inputs are identical to the user-defined definition.

5,025,365

HARDWARE IMPLEMENTED CACHE COHERENCY PROTOCOL WITH DUPLICATED DISTRIBUTED DIRECTORIES FOR HIGH-PERFORMANCE MULTIPROCESSORS

Sanjay S. Mathur, Mission Viejo, and John S. Fernando, Los Angeles, both of Calif., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Nov. 14, 1988, Ser. No. 270,324

Int. Cl.[5] G06F *12/12, 13/00*

U.S. Cl. 364—200 **11 Claims**

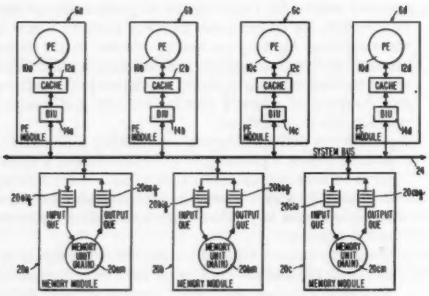
1. Twice Amended In a multiple processor network where each processor has its own private cache means and private interface means connected to a main memory means via a common system bus, which carries commands from said processors, a method for ensuring minimal processor-cache access time and guaranteeing that any data accessed from main memory and/or a private cache means by any processor, is up-to-

date and currently coherent, said method comprising the steps of:

(a) maintaining a cache directory in said cache means to indicate the presence of an addressed block of data in said cache means and its status condition as to whether the said block of data is currently valid and unable or invalid and not usable;

(b) enabling any one of said processors to access blocks of data from said main memory means or from the said cache means of its own private cache means of from the private cache means of another processor;

(c) establishing a private image directory for each processor which non-atomically updates validity status information in said cache directory;



(d) monitoring said common system bus to sense any updated changes in data blocks in said cache means or said main memory means which were written into by any processor;

(d1) evaluating the collective response of receivers to a command on said system bus to determine which receiver should accept the command;

(d2) updating the image directories of each said cache means;

(d3) updating the validity status information in each cache directory;

(e) comparing and checking the status in the said cache directory and image directory of a data block, requested by a processor, via said system bus, to verify its current validity before enabling said data cache means for data access by a requesting processor.

5,025,366

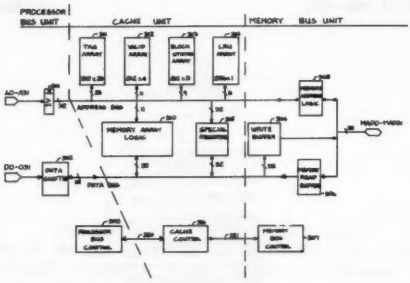
ORGANIZATION OF AN INTEGRATED CACHE UNIT FOR FLEXIBLE USAGE IN CACHE SYSTEM DESIGN

Gigy Baror, Austin, Tex., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jan. 20, 1988, Ser. No. 146,009
Int. Cl.[5] G06F *12/08*
U.S. Cl. 364—200 **38 Claims**

1. A computer system comprising a programmable cache unit on a single integrated circuit chip, at least one central processing unit (CPU), a memory separate from the cache unit, a memory bus for coupling addresses and data between the CPU and said memory, a memory bus interface unit connected between the memory bus and the cache unit for controlling coupling of addresses and data between the cache unit and the memory bus, an address bus coupled to the CPU, a data bus coupled to the CPU, a processor bus interface unit connected between the address and data buses and the cache unit for controlling coupling of data between the data bus and the cache unit, said cache unit including:

(a) memory array means, tag array means and valid array means, said programmable cache unit being coupled to said processor bus interface unit and said memory bus interface unit performing cache functions, an address bus in the cache unit connected to the processor bus interface unit connecting the memory array means of the programmable cache unit with said tag array means and valid array means so that said tag array means and valid array means control coupling of signals between the processor and the memory array means of the programmable cache unit via the processor bus interface unit; said tag array means, said valid array means and said memory array means being organized as a 2^n way set associative cache, where n is an integer greater than or equal to zero; and



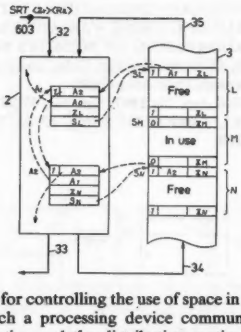
(b) means for controlling said programmable cache unit so said memory means separate from said programmable cache unit is coupled with said tag array means and valid array means to be responsive to signals derived from said tag array means and valid array means so that said tag array means and valid array means control coupling of signals between the CPU and the memory means separate from said programmable cache unit.

5,025,367

STORAGE ALLOCATION AND GARBAGE COLLECTION USING LIBERATE SPACE TOKENS

John R. Gurd, Manchester, United Kingdom, and Katsura Kawakami, Kanagawaken, Japan, assignors to Victoria University of Manchester, Manchester, United Kingdom and Matsushita Electrical Industrial Co., Ltd., Osaka, Japan

Filed May 28, 1987, Ser. No. 55,716
Int. Cl.[5] G06F *9/312, 12/02, 12/12*
U.S. Cl. 364—200 **5 Claims**



1. A method for controlling the use of space in a data storage system in which a processing device communicates with a distribution section and the distribution section manages the allocation of space in a memory section in response to communications with the processing device, comprising:

a. storing available allocator addresses in the memory section, each available allocator address identifying a respective portion of a memory of the distribution section which is available to store allocator data,

b. storing in the memory section, for each free space within the memory, data identifying the length of the free space

selecting an allocator address from the available allocator addresses stored in the memory section,

c. storing the allocator address selected from the available allocator addresses in the memory section for each free space,

d. storing allocator data in the portions of the distribution section identified by the selected allocator addresses, each portion storing a pointer to the free space for which the allocator address of that portion is stored and each portion storing length data identifying the length of the free space for which the allocator address of the portion is stored,

e. identifying any space within the memory section which becomes available for use.

f. identifying any space within the memory section which can be combined with the space which becomes available,

g. transmitting a liberate space token from the memory section to the distribution section for each space which becomes available, the liberate space token including as a first allocator address an address selected from the available allocator addresses stored in the memory section, and as a second allocator address the address stored in the memory section for any one of the space which can be combined.

h storing a first allocator at the first address in the event that no such second address is included in the liberate space token, the stored allocator pointing to the space which becomes available to indicate that that space is free,

i. combining the space which becomes available and the space which can be combined therewith in the event that the second address is included in the liberate space token, and the second allocator address points to a free space in the memory section, the spaces being combined to form a single free space, and storing a second allocator at the first address which allocator points to the single free space and includes length data identifying the length of the combined space, and

j. storing a third allocator at the first address in the event that the second address is included in the liberate space token, and the second allocator address does not point to a free space in the memory section, the allocator being stored at the first address and pointing to the space within the memory section which becomes available to indicate that that space is free,

whereby the liberate space token carries with it sufficient information to be able to recognize, from the status of the allocators, whether or not it is appropriate to combine free spaces.

5,025,368

MICROPROCESSOR WITH OPTION AREA ADJACENT CPU CORE FACILITATING INTERFACING WITH PERIPHERAL DEVICES

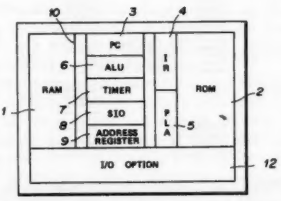
Nobuhisa Watanabe, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 18, 1985, Ser. No. 810,192

Claims priority, application Japan, Dec. 27, 1984, 59-281592; Dec. 27, 1984, 59-281593; Dec. 27, 1984, 59-281594

Int. Cl.[5] G06F *15/76*

U.S. Cl. 364—200 **18 Claims**



1. A microprocessor having architecture comprising:

a CPU core having a first, second and third peripheral edges, which first and second peripheral edges are located on opposite sides of said CPU core and connected by said third peripheral edge;

a RAM adjoining said first peripheral edge of said CPU core;

a ROM adjoining said second peripheral edge of said CPU core; and

an input/output option structurally adapted for interfacing with various peripheral devices and adjoining said third peripheral edge of said CPU core and parallel peripheral edges of said RAM and ROM.

5,025,369

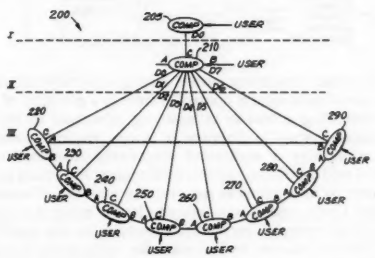
COMPUTER SYSTEM

David J. Schwartz, Woodmere, N.Y., assignor to David Schwartz Enterprises, Inc., New York, N.Y.

Filed Aug. 25, 1988, Ser. No. 236,493

Int. Cl.[5] G06F *15/16*

U.S. Cl. 364—200 **70 Claims**



1. A multilevel computer system including high level computing means and low level computing means, comprising:

said high level computer means including at least one computer and operable for receiving a task, for distributing one or more portions of the task to said low level computer means for processing based on the availability, as determined by said high level computer means, of the low level computer means to process said one or more portions of the task, and for processing, if currently available, all undistributed portions of the task;

said low level computer means including at least two computers and operable for receiving an additional task, for processing, if currently available, portions of the additional task, for distributing for processing those portions of the unprocessed additional task to high level computer means based on the availability, as determined by said low level computer means, of the high level computer means to process one or more portions of the unprocessed additional task, and for processing portions of the task received from said high level computer means; and

communications link means for transferring portions of the task within the computer system, said communications link means including first link means and second link means, said first link means coupling said at least one computer of said high level computer means to said at least two computers of said low level computer means, each of said second link means coupling said at least two computers of said low level computer means together;

wherein the availability of said low level computer means is communicated to said high level computer means and the availability of said high level computer means is communicated to said low level computer means along said first link means; and

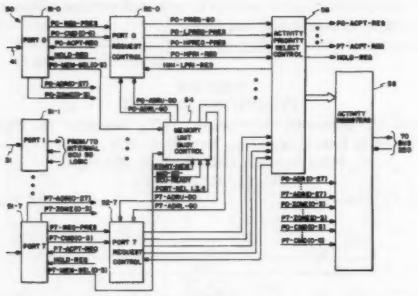
wherein the number of first and second link means associated with at least one of the at least two computers of said low level computer means are unequal.

5,025,370

CIRCUIT FOR PREVENTING LOCK-OUT OF HIGH PRIORITY REQUESTS TO A SYSTEM CONTROLLER

Robert J. Koegel, 4621 Orchid La., Glendale, Ariz. 85302, and Leonard Rabins, 8625 E. Monterosa, Scottsdale, Ariz. 85251

Filed Sep. 2, 1986, Ser. No. 902,544
Int. Cl.[5] G06F *11/00*
U.S. Cl. 364—200 3 Claims



1. In a data processing system having a plurality of subsystems including a system controller having a plurality of ports for controlling access to at least one subsystem of the data processing system in response to access request commands from a plurality of equipment operatively connected to the ports of said system controller, each request for access applied to a port by an equipment has one of a plurality of command priority levels, one of said priority levels being the highest, each of the ports of the system controller having a different port priority relative to the ports for each given command priority level, the port priority levels of ports for a given command priority level being conditionally rotated when a request for access for equipment connected to a given port having the highest port priority is granted access by the system controller, said system controller including a circuit for preventing lock-out of access requests having a higher command priority level or a higher port priority, said circuit comprising:

a) counter means for counting the number of times access request commands having a lower command priority level or a lower port priority are granted access by the system controller while access request commands having a higher command priority or higher port priority are pending, the counter means producing a count value which is temporarily stored in said counter means; and

b) compare means, operatively connected to said counter means, for comparing said count value of said counter means to a predetermined value, and for generating a control signal when said count value is equal to said predetermined value, said control signal being coupled to each of ports of the the system controller to inhibit the ports from accepting any further access request commands from the equipments connected to said ports.

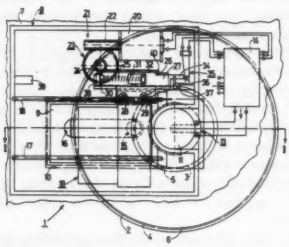
5,025,371

OVERLOAD PROTECTED RACK AND PINION DRIVE FOR AN OPTICAL SCANNING DEVICE

Norbert Heinrich, Vienna, Austria, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 13, 1988, Ser. No. 257,259
Claims priority, application Austria, Oct. 16, 1987, 2742/87
Int. Cl.[5] G11B *17/30*
U.S. Cl. 369—219 1 Claim

1. A reproducing apparatus for a rotatable disc-shaped record carrier on which information signals are stored in spiral tracks, comprising a scanning device for scanning the tracks, which scanning device is arranged on a slide which is movable in a radial direction relative to the record carrier, which slide is movable by a motor via a gear mechanism to position the scanning device between an innermost position and an outermost position, which gear mechanism comprises a pinion which can be driven by the motor and two juxtaposed gear racks which can be driven by the pinion, which are slidably guided parallel to one another, and which are tensioned relative to each other by means of a spring, one of said gear racks being fixedly connected to the slide and a stop which is fixedly connected to said gear rack abutting, against a fixed stop on the



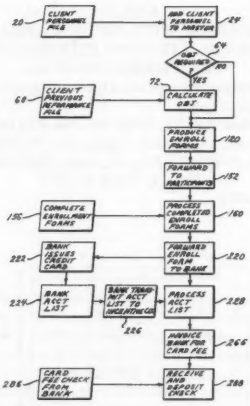
apparatus when the scanning device is set to one of said positions, characterized in that when the slide abuts against the fixed stop on the apparatus the gear rack, which is rigidly connected to the slide, is not in mesh with the pinion and at least one end tooth the other gear rack is situated within the range of meshing with the pinion and the spring which tensions the two gear racks relative to one another holds the slide positioned against the fixed stop on the apparatus and urges the other gear rack towards the pinion.

5,025,372

SYSTEM AND METHOD FOR ADMINISTRATION OF INCENTIVE AWARD PROGRAM THROUGH USE OF CREDIT

James F. Burton, Ladue, and Daniel L. Henke, St. Louis, both of Mo., assignors to Meridian Enterprises, Inc., St. Louis, Mo.

Continuation of Ser. No. 98,008, Sep. 17, 1987, abandoned. This application Sep. 25, 1989, Ser. No. 412,570
Int. Cl.[5] G06F *15/21*
U.S. Cl. 364—406 32 Claims



1. In a system for an incentive award program for a company having individual program participants and having levels of performance set as goals to be achieved by participants for the company, improvements comprising:

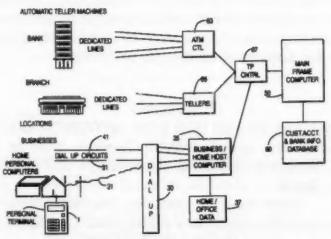
(a) computer memory means for data storing of information identifying the participants;
(b) credit instruments for the participants, and computer data processing means for assigning individual credit instrument account numbers and corresponding accounts to the individual participants;
(c) computer memory means for storing levels of performance to be achieved by the participants under the incentive program in order for the individual participants to have money credited for available use to the individual participants' credit instrument account; and
(d) computer data processing means for allocating monetary amounts to be credited for available use through the individual participant's credit instruments based on the participant's meeting of a designated level of performance under the incentive program.

5,025,373

PORTABLE PERSONAL-BANKING SYSTEM

George T. Keyser, Jr., Potomac; Carl R. Fosler, Gaithersburg, and Jeffrey D. Johnson, Rockville, all of Md., assignors to JML Communications, Inc., Washington, D.C.

Filed Jun. 30, 1988, Ser. No. 214,263
Int. Cl.[5] G06C *13/30*
U.S. Cl. 364—408 **28 Claims**



1. A portable personal banking terminal for use in a banking terminal system comprising:
an m line by n character display where m is between one and four and n is between 12 and 32,
a data modulator and demodulator for transmitting data over a telephone line,
an automatic telephone dialer for supervising and actuating a switched telephone connection over a public switched telephone network to a host computer, a data entry means for providing ten plus i selectable choices, the choices comprising ten numerical choices and i functional elements wherein i is between two and ten and
a controller, coupled to the display, the data modulator and demodulator, the automatic telephone dialer and the data entry means, for encrypting and formatting data in packets for transmission to the host computer, for validating and controlling the display of data entered via the data entry means during any of a local, an initialization or a banking mode of operation, and for controlling actuation of the switched telephone connection to the host computer during the initialization mode of operation, the controller being further responsive to the host computer during the baking mode of operation for controlling the display and storage of text messages, prompts and data transmitted from the host computer,
the terminal adapted to be handheld and having a front and a rear surface, the front surface providing a location for the data entry means and display and the rear surface providing a pocket for banking forms and a writing table.

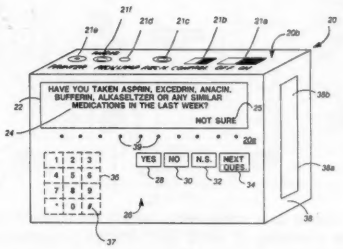
18. A portable personal banking terminal for use in an initialization and a banking mode of operation in a banking terminal system comprising a host computer and for use in a local mode of operation without the banking terminal system, the portable personal banking terminal during the local mode of operation serving as a personal banking manager and during a banking mode of operation under host computer control as a bank information retrieval terminal,
the terminal adapted to be handheld and having a front and a rear surface, the front surface providing means for data entry and display and the rear surface providing a pocket for banking forms and a writing table.

5,025,374

PORTABLE SYSTEM FOR CHOOSING PRE-OPERATIVE PATIENT TEST

Michael Roizen, Chicago; William E. Turcotte, II, Oak Park, and Richard E. Pfisterer, Arlington Heights, all of Ill., assignors to ARCH Development Corp., Chicago, Ill.

Filed Dec. 9, 1987, Ser. No. 130,934
Int. Cl.[5] G06F *15/42*
U.S. Cl. 364—413.02 **8 Claims**



1. A portable patient-operable pre-operative test selector especially for use by bed-ridden pre-operative patients, said selector comprising:
power supply means for accepting a battery, electronic circuitry connected to derive operating power exclusively from a battery when installed in said power supply means, said electronic circuitry including data-storage means for storing a series of pre-operative questions directed to the determination of which pre-operative diagnostic tests should be undergone by a patient before surgery, reflective display means, programmable data-processing means, control program storage means for storing a program for controlling said data-processing means, a special-purpose control program stored therein, said control program being arranged for displaying said pre-operative questions serially on said display means, means operable by an unskilled patient to answer "yes" and "no" to each such question in turn, means for storing such answers, said control program being further arranged for analyzing said answers and determining therefrom which pre-operative diagnostic tests are indicated, and output means for revealing the results of such determination.

2. A portable test selector for use by an untrained patient to complete a medical questionnaire, comprising:
read-only memory means for storing (i) a series of preselected medical questions related to determining which tests among a set of preselected tests the patient should undergo, and (ii) a decision table indicating for each of the tests which answers to which questions should cause that test to be determined as one the patient should undergo;
scratchpad memory means for storing data; means for reading said data from said scratchpad memory means
display means for displaying information to the patient;
interrogation means for causing the medical questions stored in said read-only memory means to be displayed to the patient by the display means;
manual input means for enabling the patient to indicate an answer to a displayed question; and
tabulating means for enabling the patient to indicate an answer to a displayed question; and
tabulating means for causing the corresponding answer

indicated by the patient via the manual input means to be stored as data in the scratchpad memory means;

wherein the read-only memory means is easily removable from the test selector and replaceable to enable updating of the medical questions and decision table.

5,025,375

VOLUME DATA TRANSMISSION SYSTEM

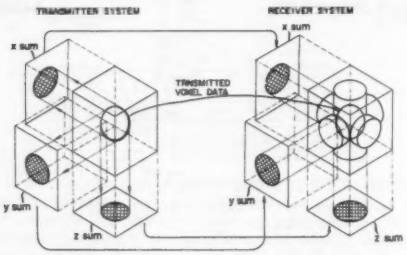
Michitaka Sugawara, Utsunomiya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 4, 1988, Ser. No. 228,148

Claims priority, application Japan, Aug. 10, 1987, 62-198105

Int. Cl.[5] G06G 7/60; G06K 9/36

U.S. Cl. 364—413.22 11 Claims



1. A volume data transmission system for transmitting volume data consisting of voxel data through a communication line, comprising:

projection data generating means for generating binary projection data from the volume data in accordance with whether predetermined significant data is included in any of the voxel data along a plurality of predetermined directions in a 3-dimensional space;

data selecting means for sequentially selecting only voxel data having significant data corresponding to any of the binary projection data on the basis of the binary projection data; and

data transmitting means for transmitting the binary projection data and the sequentially-selected voxel data.

5,025,376

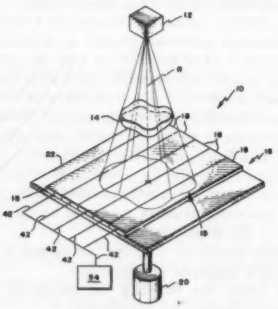
RADIATION TELETHERAPY IMAGING SYSTEM HAVING PLURAL IONIZATION CHAMBERS

Frank J. Bova; Lawrence T. Fitzgerald, and Walter Mauderli, all of Gainesville, Fla., assignors to University of Florida, Gainesville, Fla.

Filed Sep. 30, 1988, Ser. No. 251,529

Int. Cl.[5] G01T 1/185; H01J 47/04

U.S. Cl. 364—413.26 29 Claims



1. Apparatus for imaging a high energy beam of radiation emanated from a radiation source and transmitted through an object comprising:

detector means for quantitatively measuring and detecting said transmitted radiation, said detector means comprising a plurality of ion chambers each of said ion chambers having a longitudinal extent, said ion chambers being disposed in a parallel, side-by-side manner whereby said detector means comprises a parallel array of said longitudinally extending ion chambers;

said plurality of ion chambers comprising at least a first front surface electrode and a plurality of substantially parallel, longitudinally extending collecting electrodes disposed to be facing said front surface electrode and spaced apart at a predetermined distance, wherein said plurality of ion chambers has a predetermined total width at least as great as a maximum width dimension of a target area to be imaged, and wherein said longitudinal extent of each of said plurality of ion chambers has a predetermined length at least as great as a maximum length dimension of said target area,

said detector means being disposed on a side of said object opposite that of said radiation source;

means for converting an ionization current measured by each of said ion chambers into projection data representative of an amount of radiation absorbed by each of said ion chambers;

means for converting said projection data obtained from each of said ion chambers into a single projection containing data measured from each of said ion chambers; and

means for displaying said single projection.

5,025,377

POSITION DETECTOR FOR MOVING VEHICLE

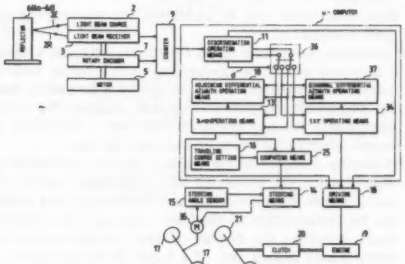
Kenji Kamimura, and Sadachika Tsuzuki, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 28, 1989, Ser. No. 442,371

Claims priority, application Japan, Dec. 12, 1988, 63-313539

Int. Cl.[5] G06F 15/50

U.S. Cl. 364—424.02 5 Claims



1. A position-detecting system for a moving vehicle that is adapted to travel through a working area whose boundaries are defined by light reflectors disposed at four spaced reference points none of which reflectors carries any identification information regarding the position of said reflector, said vehicle including a light source that scans a light beam horizontally around a fixed axis on said vehicle, said vehicle including light-receiving means disposed at said fixed axis for receiving light reflected by said light reflectors, and said vehicle also including control means for detecting the position of said moving vehicle on the basis of signals derived from reflected light received by said light receiving means, said control means comprising:

means for detecting the azimuths of said reference points

with respect to the advance direction of the moving vehicle based on light-receiving intervals of the light-receiving means;

first operating means for operating the position of the moving vehicle on the basis of preset positional information as well as the azimuths of the reference points;

second operating means for operating the position of the moving vehicle on the basis of preset positional information and the azimuths of any three reference points out of said four reference points;

discrimination processing means having means for outputting a reference point-missing signal when a light beam signal is not detected from one of the four reference points; and

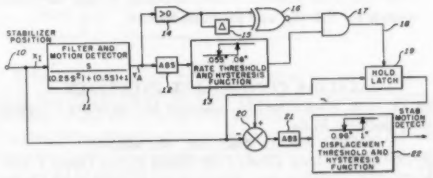
a switching means responsive to occurrence of said reference-point missing signal for transferring control from said first operating means to said second operating means to allow the second operating means to operate the position of the moving vehicle on the basis of the positional information as well as the azimuths of the three reference points other than the reference point that was missed.

5,025,378

HORIZONTAL STABILIZER MOTION DETECTOR

Jeffrey A. Kahler, Phoenix, Ariz., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 3, 1989, Ser. No. 332,852
Int. Cl.[5] G05D *1/00*; G06F *15/20*
U.S. Cl. 364—424.06 **12 Claims**



8. Programmed computer apparatus for generating a warning signal in response to a position signal of a control surface of a maneuverable craft when said control surface exceeds a predetermined rate of displacement over a predetermined displacement, said position signal being proportional to the displacement of said control surface, said apparatus comprising

motion filter means responsive to said position signal for providing an output signal in accordance with the rate of change of said position signal, said motion filter means comprising a Chebychev filter,

first threshold means for detecting when said output signal of said motion filter means exceeds said predetermined rate and providing a logic signal in accordance therewith, and

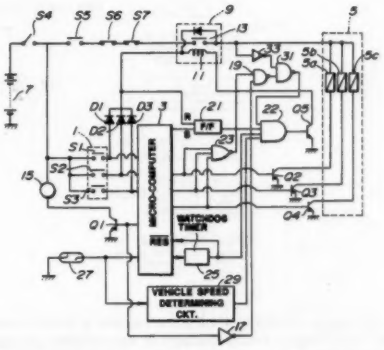
second threshold means responsive to said logic signal and said position signal for providing said warning signal when said position signal indicates that said control surface has traversed a displacement greater than said predetermined displacement while said logic signal has indicated that said output signal of said motion filter means was exceeding said predetermined rate.

5,025,379

SYSTEM AND METHOD FOR AUTOMATICALLY CONTROLLING VEHICLE SPEED TO DESIRED CRUISE SPEED USING MICROCOMPUTER

Yoshiyuki Etoh; Hiroshi Inoue; Kazuyuki Mori; Koichi Suzuki; Kinichiro Nakano; Hiroyuki Nomura; Isao Yamamoto, and Kiyoshi Yoshida, all of Kanagawa, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Oct. 28, 1988, Ser. No. 263,758
Claims priority, application Japan, Oct. 29, 1987, 62-273935
Int. Cl.[5] B60K *31/00*
U.S. Cl. 364—426.04 **16 Claims**



1. A method for automatically controlling a vehicle speed to a desired cruise speed, comprising the steps of:

(a) detecting the current vehicle speed;

(b) operatively outputting command signals on a cruise speed run of the vehicle, respectively;

(c) providing a microcomputer, responsive to any one of the command signals, for outputting a control command signal through each of a plurality of output ports thereof according to the corresponding one of the contents of the command signals, the microcomputer outputting a cruise signal through another output port together with the control command signals and outputting a receipt signal through still another output port upon receipt of any one of the command signals;

(d) providing a plurality of control valves for, with a power supply therefor being received, adjusting an operating variable of a vehicular engine driving force adjusting mechanism according to the contents of the control command signals outputted from the microcomputer via the respective output ports so that the current vehicle speed is controlled in accordance with the corresponding one of the contents of the command signals;

(e) determining whether any one of the command signals is outputted and thereafter the microcomputer outputs the receipt signal through the still other output port;

(f) determining whether the microcomputer falls in a cruise speed control enable state on the basis of a plurality of determining factors, the factors determining that the microcomputer enables the cruise speed control and the factors including the determination result in the step (e) that any one of the command signals is outputted and thereafter the microcomputer outputs the receipt signal through the still other output port; and

(g) enabling the power to be supplied to the control valves only when all of the determining factors satisfy a condition of enabling the power to be supplied to the control valves to execute a cruise speed control via the control valves.

5,025,380

METHOD AND DEVICE FOR CONTROLLING THE OPERATION OF AN ENGINE FOR A VEHICLE

Seiji Wataya, Himeji, and Shoichi Washino, Amagasaki, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

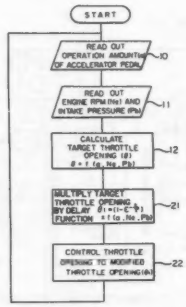
PCT No. PCT/JP88/00132, § 371 Date Oct. 11, 1988, § 102(e) Date Oct. 11, 1988, PCT Pub. No. WO88/06234, PCT Pub. Date Aug. 25, 1988

PCT Filed Feb. 10, 1988, Ser. No. 265,809

Claims priority, application Japan, Feb. 12, 1987, 62-30018

Int. Cl.[5] F02D *41/30*

U.S. Cl. 364—431.05 **23 Claims**


START
READ OUT OPERATION AMOUNT(θi) OF ACCELERATOR PEDAL
10
READ OUT ENGINE RPM (Ne) AND INTAKE PRESSURE (Pb)
11
CALCULATE TARGET THROTTLE OPENING (θ)
θ = f (α, Ne, Pb)
12
MULTIPLY TARGET THROTTLE OPENING BY DELAY FUNCTION
21
CONTROL THROTTLE OPENING TO MODIFIED THROTTLE OPENING (θi)
22

1. An engine control method for a vehicle in which a valve means in an engine intake passage is operatively associated with an accelerator pedal such that the opening degree of said valve means is changed by operation of said accelerator pedal so as to control at least one of the amount of intake air and the amount of fuel supplied to an engine, the method comprising the steps of:

sensing the amount of operation of said accelerator pedal imparted by an operator;

sensing the load condition of an engine;

sensing the number of revolutions per minute of said engine; and

gradually opening said valve means according to a non step-wise function when said accelerator pedal is operated rapidly to open said valve means to a target degree of opening which is set based on at least one of the sensed amount of accelerator pedal operation, the sensed engine load condition, and the sensed number of revolutions per minute of said engine.

5,025,381

ATTITUDE CONTROL COMPENSATOR FOR FLEXIBLE SPACECRAFT

Neil E. Goodzeit, East Windsor, Township, Mercer County, N.J., and David M. Linder, Buckingham Township, Bucks County, Penn., assignors to General Electric Company, East Windsor, N.J.

Filed Jan. 2, 1990, Ser. No. 459,627

Int. Cl.[5] G05F *15/50*; B64G *1/36*

U.S. Cl. 364—434 **9 Claims**

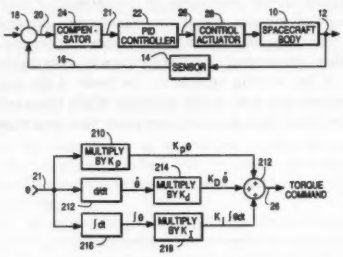
1. An attitude controller for a spacecraft having a body defining at least a primary self-resonant frequency, comprising:

torquing means coupled to the spacecraft body for generating torques for changing the attitude of said spacecraft;

sensing means coupled to said body for sensing the attitude thereof and for generating deviation signals indicative of the deviation of the attitude away from a desired attitude;

PID control means for operating on attitude error signals for summing first, second and third products, said first product being formed by multiplying a first constant by said attitude error signals, said second product being formed by multiplying a second constant by the time derivative of said attitude error signals, and said third product being formed by multiplying a third constant by the time integral of said attitude error signals;

coupling means coupled to said torquing means, said sensing means and said PID control means for coupling said PID control means in a control path responsive to said attitude error signals, and extending from said sensing means to said torquing means, for stabilizing said attitude, said coupling means further including compensation means cascaded with said PID control means, said compensation means having a transfer characteristic including a gain function which is substantially constant below a frequency of about ω/7, which gain function includes (a) a compo-



nent representing a monotonic decrease in gain with increasing frequency from said frequency ω/7, superimposed upon (b) a notch component at a frequency of ω, where ω is selected to be slightly below the self-resonant frequency of said spacecraft, said transfer function including a phase response which tends toward zero degrees as frequency decreases from said frequency of ω/7, and which progressively lags toward −180 degrees with frequency increasing from ω/7 toward ω, and which from a value of +180 degrees at ω becomes monotonically more negative and tends toward −90 degrees at frequencies far above ω, whereby said compensation means cascaded with said PID control means responds to said deviation signals for driving said torquing means.

5,025,382

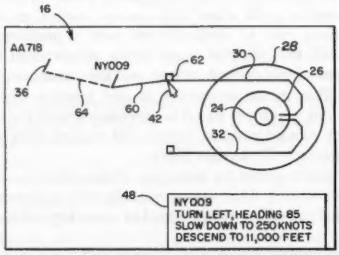
DATALINK CONTROLLER INTERFACE

John M. Artz, Rockville, Md., assignor to The Mitre Corporation, Bedford, Mass.

Filed Dec. 12, 1989, Ser. No. 448,965

Int. Cl.[5] G06F *15/48*; G09G *1/00*; G08B *21/00*; G08G *1/123*

U.S. Cl. 364—439 **16 Claims**



1. A method for providing a digital data link between an air traffic controller at a ground station and the pilot of an aircraft through digital communication between a ground-based computer located at the ground station and including an associated display screen containing a spatial representation of the airspace around the aircraft as well as representation of the loca-

tion of the aircraft in that airspace, and a computer on that aircraft, said method comprising:

moving a pointing device to cause movement of a cursor on said display screen, beginning at the representation of the aircraft, to generate a continuous line on the screen between the representation of the aircraft and the cursor corresponding to a potential flight path of the aircraft,

generating on said screen, in response to the production of a said continuous line corresponding to the flight path of the aircraft that the controller intends, a static cursorline representative of the intended flight path of aircraft;

using the ground-base computer to calculate, from beginning and the end points of the cursorline, the intended heading of the aircraft; and

transmitting digital data related to calculated intended heading to the aircraft computer.

5,025,383

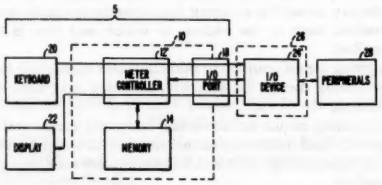
POSTAGE METER TRANSPARENT I/O INTERFACE

John G. Haines, Oakland; Nolan G. Rosenbaum, Hayward; Albert L. Pion, Berkeley, all of Calif.; Marc Lecarpentier, Antony; Christophe Henriot, Crepy en Valois, both of France, and Cyrus Abumehdi, Harlow, England, assignors to FME Corporation, Hayward, Calif.

Continuation of Ser. No. 146,919, Jan. 22, 1988, abandoned. This application Jun. 5, 1990, Ser. No. 534,013

Int. Cl.[5] G06F *15/20*

U.S. Cl. 364—464.03 **9 Claims**



1. In a postage meter having first input means for entering data, first output means for displaying data, means for printing postage, means for storing data, second input means for entering data from external devices, second output means for writing data to external devices, and a meter controller electrically connected to each of the aforesaid means and programmed for processing data and for controlling the operation of the postage meter, the improvement wherein the meter controller comprises:

mode means, having two states, for defining two modes for the meter, designated a normal mode and a transparent mode;

first means, responsive to the mode means and responsive to data entered on the first input means for (a) directing meter operation in response to data representing a valid meter function when the meter is in the normal mode, (b) transferring data not representing a valid meter function to the second output means without directing meter operation when the meter is in the normal mode, and (c) transferring all data entered on the first input means to the second output means without directing meter operation when the meter is in the transparent mode; and

second means, responsive to the mode means and responsive to data entered on the second input means for transferring at least some data entered on the second input means to the first output means without directing meter operation when the meter is in the transparent mode.

5,025,384

PRODUCTION PROCESS CONTROL SYSTEM

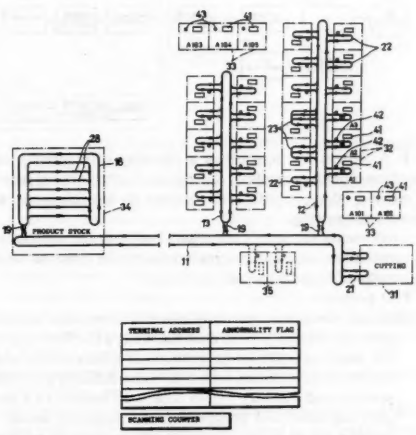
Mitsuji Teranishi; Yasuo Watanabe, and Akira Takeuchi, all of Osaka, Japan, assignors to Asics Corporation, Kobe, Japan

Continuation of Ser. No. 292,457, Dec. 30, 1988, abandoned, which is a division of Ser. No. 171,226, Mar. 22, 1988, Pat. No. 4,878,176, which is a continuation of Ser. No. 730,185, May 3, 1985, abandoned. This application Oct. 26, 1989, Ser. No. 428,023

Claims priority, application Japan, May 4, 1984, 59-65803[U]; May 4, 1984, 59-65804[U]; May 4, 1984, 59-65805[U]; May 4, 1984, 59-89831; May 4, 1984, 59-89832; May 4, 1984, 59-89833; May 4, 1984, 59-89834; May 4, 1984, 59-89835; May 4, 1984, 59-89836; May 4, 1984, 59-89837

Int. Cl.[5] G06F *15/00*

U.S. Cl. 364—468 **8 Claims**



1. A system for communicating between a plurality of terminal devices and a central device connected to said plurality of terminal devices, wherein the central device comprises:

communicating means for taking the initiative and performing communication with the plurality of terminal devices in a predetermined order by scanning the terminal devices and for detecting an abnormality of a terminal device in communication therewith;

an abnormal terminal table in which the abnormality of said terminal devices is registered;

means for checking whether an abnormality is registered for a particular one of the terminal devices with reference to the table before communicating with said particular terminal device and generating a corresponding output;

control means responsive to the output of the checking means, for causing the communicating means to proceed to communication processing with said particular terminal device when no abnormality is registered and for causing the checking means to check the next terminal device for abnormality registration when an abnormality is registered; and

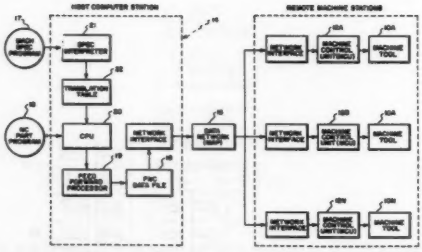
means for registering in said abnormal terminal table any terminal device that is found abnormal by the communicating means.

5,025,385

MULTIPLE AXIS MOTION CONTROL SYSTEM

Stanley G. Froyd, 5537 Calle Arena, Carpenteria, Calif. 93013

Division of Ser. No. 181,820, Apr. 15, 1988, Pat. No. 4,947,336.
This application May 25, 1990, Ser. No. 529,132
Int. Cl.[5] G06F *15/46*
U.S. Cl. 364—474.11 3 Claims



1. A system for controlling a plurality of machines, each machine including multiple independent actuators for moving a member along a path with respect to multiple axes, said system comprising:

input means for supplying a part program for each of said machines, each part program defining the terminal coordinates of successive path portions;

host computer means;

program means for operating said host computer means to generate with respect to each machine, a feedforward data file based on said part program input means comprised of a series of data blocks, each data block defining a profile of position and velocity versus time with respect to a linear path segment, said program means including means for looking ahead at the direction and magnitude of subsequent path portions to generate the data block defining each path segment;

a plurality of machine control units, each connected to a different machine;

means for distributing each data file generated by said host computer means to one of said machine control units;

each of said machine control units including:

position commander means responsive to each data block for generating a plurality of command position signals each associated with a different actuator;

velocity profiler means responsive to each data block for generating a plurality of feedforward velocity signals, each associated with a different actuator;

each actuator having associated therewith;

position sensor means for generating an actual position signal with respect to the associated actuator;

means for summing the command position and actual position signals generated with respect to the associated actuator for producing a position error signal for that actuator; and

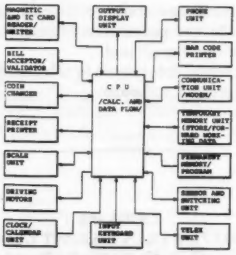
means for summing said command position error and feedforward velocity signals generated with respect to each actuator for producing a command velocity signal with respect to that actuator.

5,025,386

AUTOMATED MAIL COLLECTING AND TELECOMMUNICATION MACHINE II

Pavo Pusic, Moluntska 6, Dubrovnik, Yugoslavia 500000

Continuation-in-part of Ser. No. 226,778, Aug. 1, 1988, Pat. No. 4,900,905. This application Oct. 25, 1988, Ser. No. 262,029
The portion of the term of this patent subsequent to Feb. 13, 2007, has been disclaimed.
Int. Cl.[5] G06F *15/20*
U.S. Cl. 364—478 19 Claims



1. Self-contained apparatus for processing and collecting an item to be mailed comprising:

computer means;

display means coupled to said computer means, said display means displaying information associated with the use of the apparatus such as the instructions for using said apparatus;

receiving means coupled to said computer means for receiving the item to be mailed;

data entry means coupled to said computer means and to said display means for entering data relating to the item to be mailed, such as the address to which said item is to be mailed;

weighing means coupled to said computer means and to said receiving means for securely weighing said item to be mailed;

determining means including said computer means and coupled to said data entry means and to said weighing means for determining the required postage for said item to be mailed;

payment means for accepting and verifying payment for said postage including said computer means and coupled to said display means, to said data entry means, and to said determining means;

means coupled to said computer means for providing machine readable information concerning the item to be mailed on the item to be mailed, such as the zip code to which said item is to be mailed;

transport means coupled to said computer means for transporting the item to be mailed from said receiving means to a storage area for subsequent pick up; and

means coupled to said transport means for moving said transport means to drop said item in said storage area and moving said transport means to its original position after said item has been dropped in said storage area.

5,025,387

POWER SAVING ARRANGEMENT FOR A CLOCKED DIGITAL CIRCUIT

Terrie L. Frane, Bloomingdale, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 240,320, Sep. 6, 1988, abandoned. This application Jun. 1, 1990, Ser. No. 532,157
Int. Cl.[5] G06F *1/04;* H03K *5/04*
U.S. Cl. 364—493 16 Claims

12. An electronic circuit having a plurality of electronic components, processing means for generating a disable signal, a peripheral circuit for generating an interrupt signal, clocking

means for generating a first clock signal at a first predetermined frequency, and a power control apparatus, the power control apparatus comprising:

a) disabling means, generating a second clock signal at the first predetermined frequency, coupled to the processing means and the first clock signal, for disabling the second clock signal clocking in response to the disable signal, and enabling the second clock signal in response to the interrupt signal; and

b) means, generating a third clock signal at the first predetermined frequency, coupled to the first clock signal and the peripheral circuit, for reducing, in response to the disable signal, the first predetermined frequency of the third clock signal to a second predetermined frequency, and increasing, in response to the interrupt signal, the second predetermined frequency to the first predetermined frequency;

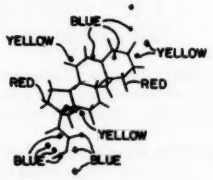
wherein the processing means consumes substantially no power when the second clock signal is disabled and the control means consumes less power when the first predetermined frequency of the third clock signal is reduced to the second predetermined frequency.

5,025,388

COMPARATIVE MOLECULAR FIELD ANALYSIS (COMFA)

Richard D. Cramer, III, 4100 Laclede Avenue, #314, St. Louis, Mo. 63108, and Svante B. Wold, 3326A Gullsjö, S-9110, Vännäs, Sweden

Filed Aug. 26, 1988, Ser. No. 237,491
Int. Cl.[5] G06F *13/46*
U.S. Cl. 364—496 **93 Claims**



1. A computer-based method of generating and visualizing a three-dimensional quantitative structure activity relationship of a series of molecules comprising the steps of:

(a) defining molecular shape descriptors for each molecule in said series of molecules wherein each molecule is associated with a unique parameter value;

(b) aligning each molecule in said series with the common shape elements of all the molecules in said series;

(c) correlating the molecular shape descriptors and unique parameter value of each molecule with all the other molecules in said series;

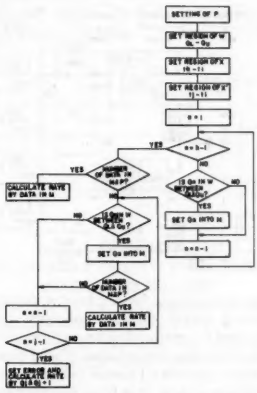
(d) visually displaying using computer graphics the correlation among the molecules in said series.

5,025,389

METHOD OF ANALYZING REACTION RATE IN CHEMICAL ANALYSIS

Toshiaki Imai, Otawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 13, 1989, Ser. No. 296,823
Claims priority, application Japan, Jan. 16, 1988, 63-7960
Int. Cl.[5] G06F *15/42*
U.S. Cl. 364—497 **4 Claims**



1. A method of analyzing a reaction rate in chemical analysis, comprising the steps of:

reacting at least one sample and at least one reagent;

first measuring at various time points the level of reaction of a sample and the reagent so as to provide a plurality of measurement region bands;

dividing each of the plurality of said measurement region bands different which have time series n which the said reaction rate is measured and stored;

finding within said measurements one of said samples high in active value by using data included in the region band in a forward position in said time series;

second measuring a sample which will have a normal or low active value; and

finding an active value by using a data look up of data which was part of the measurement indicated in the region band in a backward position in said time series in relation to said forward position.

5,025,390

ROBOTIC WORKCELL CONTROL SYSTEM WITH A BINARY ACCELERATOR PROVIDING ENHANCED BINARY CALCULATIONS

Kenneth E. Daggett, Murrysville, Pa., assignor to Staubli International AG, Switzerland

Filed Jan. 31, 1989, Ser. No. 304,971
Int. Cl.[5] G06F *15/46, 15/16*
U.S. Cl. 364—513 **5 Claims**

1. A control system for a robotic workcell having at least one electric robot and a plurality of workcell equipment items in turn having a plurality of control and sensor devices associated therewith, said system comprising:

an electronic robot controller disposed at a first workcell location to operate said robot as a part of the workcell process;

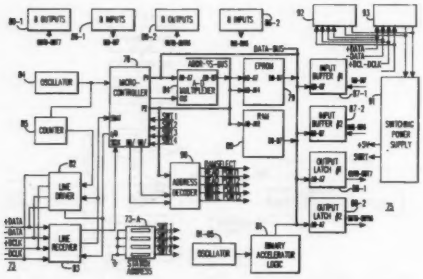
means for loading program data into said robot controller;

at least one input/output control module disposed at a second workcell location and having connected thereto as inputs a first group of sensor devices and as outputs a first group of said control devices; and

means for linking said robot controller and said input/output

module to provide for program and process data communication;

said input/output module having computing means including a microprocessor for operating the module in accordance with a system operating program downloadable from said robot controller to said module and for processing inputs and outputs in accordance with a user process program downloadable from said robot controller to the module;



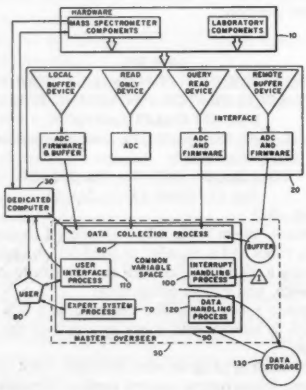
said input/output module further having coprocessor means for executing binary equation solutions and storing the results thereof for processing by said microprocessor and thereby accelerating the solution of said binary equations; wherein said coprocessor means includes circuit means for fetching binary instructions from memory and for sequentially executing the binary instructions to produce binary equation solutions in accordance with a reverse polish notation calculation system.

5,025,391

EXPERT OVERSEER FOR MASS SPECTROMETER SYSTEM

Evan E. Filby, Idaho Falls, and Richard A. Rankin, Ammon, both of Id., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 4, 1989, Ser. No. 333,075
Int. Cl.[5] G06F *15/18*
U.S. Cl. 364—513 **23 Claims**



1. An expert overseer system for the operation and real-time evaluation of a complex instrument system that includes key instrument components,

a computer means capable of controlling the key instrument components and producing results from the complex instrument system, and

a laboratory support system,

said expert overseer system comprising:

an interface coupling the key instrument components of the complex instrument system, the laboratory support system, and the computer means,

a master overseer system comprising the computer means and a master overseer program implemented on the computer means,

said master overseer system including a means for polling and collecting data from the key components of the complex instrument system, and the laboratory support system comprising automatically and manually specified time sequencing of said means for polling and collecting data,

a knowledge base including data obtained from said means for polling and collecting data,

heuristic rules and parametric rules responsive to the data obtained from said means for polling and collecting data, and set parameters,

an expert means responsive to said means for polling and collecting data and said knowledge base, said expert means capable of using a rule base and an inference engine to automatically analyze the status of the complex instrument system, to employ a set parameter damage prevention system, and to potentially alter a specified sampling routine,

an interrupt handling means responsive to the key instrument components of the complex instrument system and the laboratory support system, said interrupt handling means capable of initiating varying degrees of data collection by said means for polling and collecting data, and

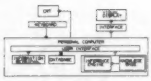
a user interface responsive to said expert means, said user interface capable of relating the output of said expert means to a human operator.

5,025,392

APPARATUS AND METHOD FOR EXPERT ANALYSIS OF METAL FAILURE WITH AUTOMATED VISUAL AIDS

Guryinder P. Singh, 9303 Lockridge, San Antonio, Tex. 78250

Continuation of Ser. No. 268,846, Nov. 9, 1988, Pat. No. 4,954,964. This application May 29, 1990, Ser. No. 529,879
The portion of the term of this patent subsequent to Sep. 4, 2007, has been disclaimed.
Int. Cl.[5] G06F *15/18*
U.S. Cl. 364—513 **13 Claims**



1. A digital processing system with expert system part failure analysis, said system comprising

a digital data processing device;

data storage means in electrical communication with said digital data processing device;

knowledge base means carried on said data storage means for identifying a possible mode of failure;

input means in electrical communication with said digital data processing device;

output means in electrical communication with said digital data processing device;

visual display means for displaying macroscopic or microscopic views of selected part failures, said visual display

means being in electrical communication with said digital data processing device;

expert system means controlling the digital data processing device for requesting and receiving, through the output device, information from a user while displaying at least one of said selected views on the visual display means, said view being associated with at least some of the requests for information;

program means for receiving responses from the user through the input device;

inference engine means for logically correlating said received information with said knowledge base to isolate possible failure modes; and

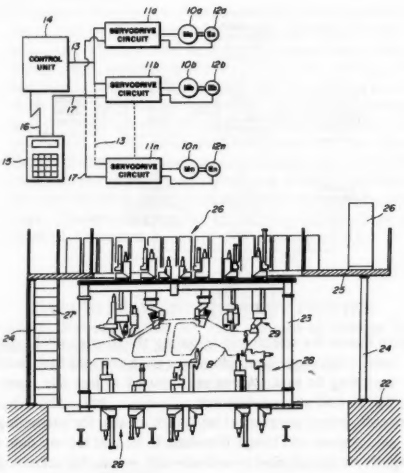
incident file means carried on said storage means for retaining a record of the information requested and received from the user.

5,025,393

TEACHING APPARATUS

Tatsuo Naito, Atsugi, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jun. 16, 1989, Ser. No. 366,926
Claims priority, application Japan, Jun. 20, 1988, 63-150061
Int. Cl.[5] G06F *15/00*
U.S. Cl. 364—513 **1 Claim**



1. A teaching apparatus for use with at least one manipulator arm for carrying out a plurality of distinct motions to carry and position a work tool for performing a work function, comprising:

a power unit including actuators for powering the respective motions of the manipulator arm;

a control unit, coupled through a first data line to the actuators, for controlling the actuators;

a teach pendant connected through a second data line to the control unit and through a third data line to the actuators, the teach pendant including means for producing a motion command on the second and third data lines, the motion command having digit information specifying a selected one of the distinct motions of the manipulator arm, and means for producing a teach command on the second data line;

the power unit including means, responsive to the motion command fed thereto through the third data line from the teach pendant, for selecting one of the actuators to power the selected motion of the manipulator arm, and means for measuring a value of displacement of the selected actuator;

the control unit including

means, responsive to the motion command fed thereto through the second at a line from the teach pendant, for specifying a memory location accommodated to the digit information of the motion command,

means, responsive to the teach command fed thereto through the second data line from the teach pendant, for transferring the measured displacement value through the first data line from the power unit, and

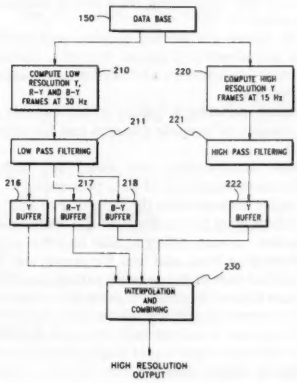
means for storing the transferred displacement value at the specified memory location.

5,025,394

METHOD AND APPARATUS FOR GENERATING ANIMATED IMAGES

Frederic I. Parke, Glen Cove, N.Y., assignor to New York Institute of Technology, Old Westbury, N.Y.

Filed Sep. 9, 1988, Ser. No. 242,434
Int. Cl.[5] G06F *15/66*
U.S. Cl. 364—518 **16 Claims**



1. A method for generating electronic representations of animated images from stored image data elements, comprising the steps of:

computing, from said stored image data elements, a first sequence of relatively low resolution frames representing animated images over a given time period and low pass filtering the information in said relatively low resolution frames;

computing, from said stored image data elements, a second sequence of relatively high resolution frames representing said animated images over the given time period and high pass filtering the information in said relatively high resolution frames, the number of frames in said second sequence being less than the number of frames in said first sequence; and

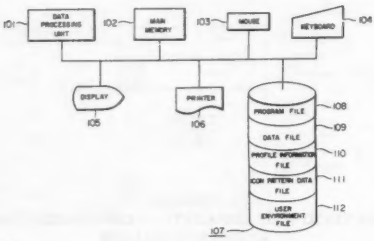
combining corresponding frames of said first and second sequences to obtain output high resolution frames representative of said animated images over said given time period.

5,025,395

DATA PROCESSING SYSTEM CAPABLE OF EXECUTING DATA PROCESSING USING RESOURCES BY DESIGNATING DISPLAYED GRAPHIC PATTERNS REPRESENTING SELECTED RESOURCES

Toshiro Nose, Tokyo; Hisashi Hashimoto, Yokohama, both of Japan, and Masato Manda, West Lebanon, N.H., assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 17, 1987, Ser. No. 15,026
Claims priority, application Japan, Feb. 21, 1986, 61-35152
Int. Cl.[5] G06F 9/44
U.S. Cl. 364—518 13 Claims



1. In a multi-user data processing system, means for designating resources, which are available for use in data processing, by displaying said resources in the form of graphic patterns and identifying names thereof, comprising:

first file means for storing respective resource identifying information to identify resources in correspondence with respective user identifying information assigned to individual users;

second file means for storing graphic patterns of said resources and identifying names thereof in correspondence with respective resource identifying information for each individual user;

display means including a display screen capable of displaying a plurality of graphic patterns and identifying names thereof;

input means for inputting user identifying information in precedence to execution of data processing;

control means responsive to the inputting of said user identifying information for reading out the resource identifying information corresponding to said inputted user identifying information from said first file means and for reading out specified ones of the graphic patterns and the identifying means thereof from said second file means on the basis of said resource identifying information read out from said first file means to output said read out graphic patterns and identifying names to said display means for display on said display screen; and

designating means for designating selectively one of the plural graphic patterns or identifying names thereof displayed by said display means to identify resources for use in performing data processing.

5,025,396

METHOD AND APPARATUS FOR MERGING A DIGITIZED IMAGE WITH AN ALPHANUMERIC CHARACTER STRING

Carol A. Parks, Monrovia, Md.; Robert E. Probst, Reston, Va.; Doraiswamy Rajagopal, Rockville, and Gary L. Youngs, Gaithersburg, both of Md., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 21, 1989, Ser. No. 326,338
Int. Cl.[5] G06F 11/10
U.S. Cl. 364—518 8 Claims

7. In a data processing system, an apparatus for storing and retrieving a digitized image of a document having fixed and variable fields, comprising:

first means for inputting to said data processing system, a bit-mapped image of a document which includes a first variable field for first type information;

second means coupled to said first means, for compressing said bit-mapped image in said system and storing the compressed image in said system, accessible using an image file name;

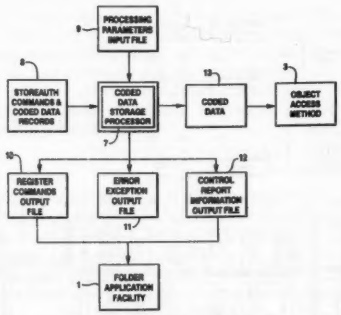
third means for inputting first field location information to said system, identifying a location of said first variable field in said bit-mapped image;

fourth means for inputting to said system a first alphanumeric character string expressing the first type information;

fifth means coupled to said third and fourth means, for assembling in said system a first data set including said first character string, said image file name, and said first field location information and storing the first data set in said system, accessible using a first object file name;

said fourth means inputting to said system a second alphanumeric character string expressing the first type information;

said fifth means assembling in said system a second data set including said second character string, said image file name, and said first field location information and storing the second data set in said system, accessible using a second object file means;



sixth means for selectively initiating the display of the document with the second character string in said first field by inputting to said system said second object file name to access said second data set;

seventh means coupled to said sixth means, for extracting in said system said image file name from said second data set;

eighth means coupled to said seventh means, for accessing in said system said compressed image using said image file name;

ninth means coupled to said eighth means, for decompressing said compressed image and storing said bit-mapped image in an image buffer in said system;

said seventh means extracting in said system said second alphanumeric character string from said second data set;

tenth means coupled to said seventh means, for converting in said system said second alphanumeric character string to corresponding pel bit shapes of the characters in the second string;

said seventh means extracting in said system said first field location information from said second data set;

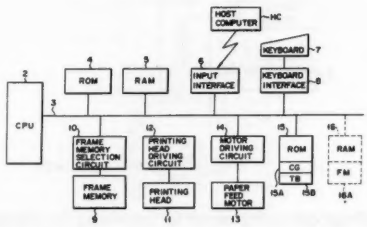
eleventh means coupled to said ninth and tenth means, for merging in said system said pel bit shapes with said bit-mapped image in the image buffer, at said first field location, forming a merged image;

twelfth means coupled to said eleventh means, for displaying said merged image from said image buffer on a display device in said system.

5,025,397
LABEL PRINTER

Michio Suzuki, Shizuoka, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Aug. 21, 1989, Ser. No. 396,537
Claims priority, application Japan, Aug. 24, 1988, 63-210010; Mar. 6, 1989, 1-53193
Int. Cl.[5] G06K *15/00*
U.S. Cl. 364—519 **8 Claims**

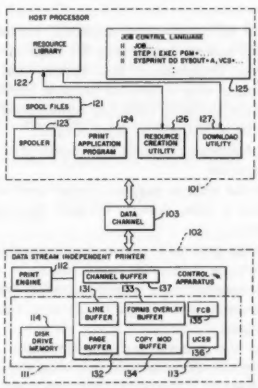


1. A label printer comprising:
input means for inputting printing data;
memory means for storing items of image data;
printing means for printing labels according to an item of said image data; and
processing means for processing printing data input by said input means, said processing means including means for checking whether said memory means already contains image data corresponding to the input printing data; means for, when it is detected that the memory means does not contain the corresponding image data, creating in said memory means new image data from the input printing data as the corresponding image data and transferring the corresponding image data from said memory means to said printing means; and means for, when it is detected that the memory means contains the corresponding image data, transferring the detected corresponding image data from said memory means to said printing means.

5,025,398
DATA STREAM INDEPENDENT PRINTER

Thomas C. Nelson, Melbourne, Fla., assignor to Storage Technology Corporation, Louisville, Colo.

Filed May 21, 1990, Ser. No. 526,505
Int. Cl.[5] G60K *15/00*
U.S. Cl. 364—519 **17 Claims**

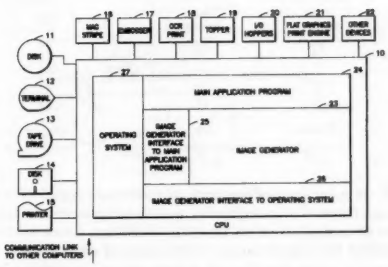


1. In a nonimpact printer system, an interface for interconnecting said nonimpact printer with a host processor line printer print driver that transmits lien printer setup data and line printer character definition data prior to transmitting line printer print character data comprising:
means for storing said line printer setup and line printer character definition data received from said print driver;
memory means for storing a plurality of character set definitions, forms overlays and copy modifications, each of said character set definitions including a plurality of print character definitions;
means, responsive to said stored line printer character definition data received from said print driver, for translating independent of operator intervention, said line printer character definition data into character set selection data;
means, responsive to said character set selection data, for selecting the one of said character set definitions stored in said memory means corresponding to said stored line printer character definition data;
means for converting said stored line printer setup data into corresponding nonimpact printer control signals; and
means for activating said nonimpact printer to print a print character corresponding to each received print character data along with forms overlays and copy modifications as designated by said line printer setup data.

5,025,399
METHOD AND APPARATUS FOR PERSONALIZING PLASTIC CARDS

Richard W. Wendt, Shakopee, and Brian Johnson, St. Louis Park, both of Minn., assignors to DataCard Corporation, Minnetonka, Minn.

Filed Sep. 23, 1988, Ser. No. 248,811
Int. Cl.[5] G06K *19/06;* **G06F** *15/626*
U.S. Cl. 364—519 **13 Claims**



1. A plastic card personalization system comprised of a computer and a graphics printer connected to the computer for printing a plurality of different types of images on the plastic cards, the card personalization system comprising:
(a) memory storage means for storing a control data stream comprising at least one graphics command;
(b) first control means executing on the computer for reading said graphics commands from the memory storage means;
(c) second control means executing on the computer for interpreting said graphics commands read from said memory storage means, and in response thereto, deciding what graphics images to use and where on the plastic cart the graphics images should be placed;
(d) said graphics commands identified in said control data stream by a command language version code;
(e) said command language version code comprised of a command delimiter code and a single character code which is used throughout the remainder of said graphics commands as a delimiter wherein said delimiter precedes every said graphics command, and further, wherein two

sequential occurrences of said delimiter signifies an end to said control data stream;

(f) said delimiter followed by at least one graphics command field comprised of a command mnemonic, an operator subfield, and a command value;

(g) said command mnemonic comprising one of a plurality of commands which supply data and commands which specify how and where the graphics images should be placed on the plastic card;

(h) said operator subfield indicating whether said command value is a transient or persistent command value, wherein said transient command value is active only during the interpretation of said command mnemonics for the particular graphics command field in which it appears, and further, wherein said persistent command value is active for all occurrences of said command mnemonics in the present and subsequent graphics command fields until a new command value is assigned to said command mnemonic; and

(i) said command value supplying data for the interpretation and operation of said command mnemonic by said second control means.

5,025,400

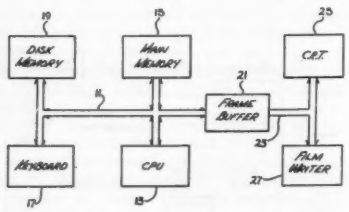
PSEUDO-RANDOM POINT SAMPLING TECHNIQUES IN COMPUTER GRAPHICS

Robert L. Cook, San Anselmo; Thomas K. Porter, Fairfax, and Loren C. Carpenter, Novato, all of Calif., assignors to Pixar, Richmond, Calif.

Continuation of Ser. No. 746,626, Jun. 19, 1985. This application Jun. 21, 1989, Ser. No. 379,503

Int. Cl.[5] G09G *1/06, 1/16*

U.S. Cl. 364—522 **62 Claims**



1. In a method of forming an electronic signal of a video image frame that individually specifies characteristic information of each pixel of an array of pixels that forms said frame, wherein the characteristic information of each pixel is determined by point sampling, at at least one point within a boundary of each of said pixels, data stored in a computer data base that specifies various parameters relating to an object scene, wherein the improvement comprises:

providing electronic point sampling of at least one of said stored parameters with a pseudo-random distribution of sample points; and

constraining said distribution such that a Fourier transform of said distribution over an infinite extent contains substantially continuous regions.

5,025,401

AUTOMOTIVE MILEAGE CALCULATING APPARATUS

Takahiro Kato, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Feb. 28, 1990, Ser. No. 486,703

Claims priority, application Japan, Oct. 17, 1989, 1-268052

Int. Cl.[5] G01C *21/00*; G06F *7/70*

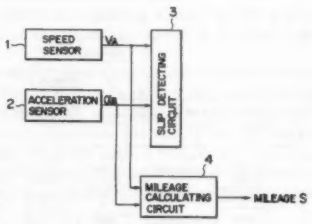
U.S. Cl. 364—561 **6 Claims**

1. An automotive mileage calculating apparatus for calculating the amount of miles travelled by an automobile during a plurality of time intervals comprising:

a vehicle speed sensor for generating a vehicle speed signal according to the running speed of the vehicle;

an acceleration sensor for detecting the acceleration of the vehicle in the direction of travel;

a slip detecting circuit for detecting a wheel slip according to the speed signal from the vehicle speed sensor and the acceleration signal from the acceleration sensor; and



a mileage calculating circuit for calculating the mileage, the mileage calculating circuit computing the mileage by using the speed signal from the vehicle speed sensor during time intervals when no wheel slip has been detected by said slip detecting circuit and, by using the acceleration signal from the acceleration sensor during time intervals when a wheel slip has been detected by said slip detecting means.

5,025,402

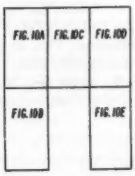
METHOD OF TRANSIENT SIMULATION OF TRANSMISSION LINE NETWORKS USING A CIRCUIT SIMULATOR

Dan Winkelstein, Raleigh, N.C., assignor to Northern Telecom Limited, Montreal, Canada

Filed Apr. 7, 1989, Ser. No. 334,325

Int. Cl.[5] G06F *15/31*

U.S. Cl. 364—578 **12 Claims**



1. A method of determining expected performance of a transmission line system comprising the steps of:

simulating the transmission line system and termination characteristics with a general purpose circuit simulator, the simulator allowing elements represented by a branch statement to be defined by a subroutine;

determining frequency domain S-parameters of the transmission line system;

calling from the general purpose circuit simulator a subroutine finding a time domain Green's function from the S-parameter;

calling from the general purpose circuit simulator a subroutine performing a circular convolution of voltages and currents at sources in the transmission line system with the Green's function providing a steady state voltage value at each port; and

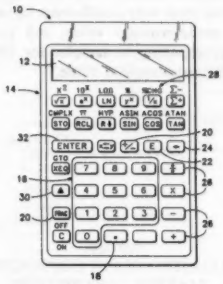
calling from the general purpose simulator a subroutine convolving the Green's function with present and past port voltages and currents at discrete times to find voltage and current at each port at each discrete time.

5,025,403

FRACTION ENTRY AND DISPLAY

Bruce A. Stephens, Corvallis, Oreg., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 30, 1989, Ser. No. 429,437
Int. Cl.[5] G06F *3/02*
U.S. Cl. 364—709.07 **10 Claims**



1. A calculator for operation by a user, the calculator comprising:

a plurality of digit entry keys for activation by the user to input a numeric value, one of said digit entry keys being a primary key;

a display;

means for presenting characters on said display corresponding to user activation of said digit entry keys whereby upon a first activation of said primary key a character corresponding to a decimal point is presented on said display, and upon a second activation of said primary key said character corresponding to a decimal point is removed from said display and a numerator-denominator separation character is presented on said display;

register means for storing a numeric value;

means for receiving a user selected denominator;

calculation means for deriving a whole value and a numerator value using said selected denominator value and said numeric value to represent said numeric value as a fraction value; and

means for presenting said whole value, numerator value, and denominator value as said fraction value on said display.

5,025,404

METHOD OF CORRECTING ERRONEOUS VALUES OF SAMPLES OF AN EQUIDISTANTLY SAMPLED SIGNAL AND DEVICE FOR CARRYING OUT THE METHOD

Augustus J. E. M. Janssen; Raymond N. J. Veldhuis; Hendrik J. Prins, and Lodewijk B. Vries, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

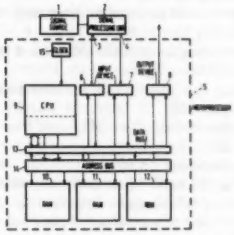
Continuation of Ser. No. 317,115, Feb. 28, 1989, abandoned, which is a continuation of Ser. No. 180,665, Mar. 30, 1988, abandoned, which is a continuation of Ser. No. 20,140, Feb. 25, 1987, abandoned, which is a continuation of Ser. No. 601,817, Apr. 19, 1984, abandoned. This application Nov. 27, 1989, Ser. No. 442,495
Claims priority, application Netherlands, Dec. 7, 1983, 8304214
Int. Cl.[5] G06F *15/353*
U.S. Cl. 364—723 **33 Claims**

24. An apparatus for correcting by interpolation erroneous values of signal samples of a uniformly sampled signal comprising:

input means for receiving sample values of said sampled signal;

detection means for identifying samples having erroneous values;

computing means for selecting a sampling interval which includes said samples having erroneous values, and for determining from said interval containing said samples having erroneous values a best fitting recursion formula and, for estimating from said recursion formula the correct value for said erroneous values of samples by determining the value of a sample as a weighted sum of the values of a number of preceding samples and their respective coefficients, and an error term.



5,025,405

METHOD OF INTERPOLATING PIXEL VALUES

Roger W. Swanson, Loveland, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 316,568, Feb. 27, 1989, abandoned, which is a continuation of Ser. No. 897,182, Aug. 15, 1986, abandoned. This application Oct. 11, 1989, Ser. No. 421,298
Int. Cl.[5] G06F *7/38, 15/00*; G09G *1/06*
U.S. Cl. 364—723 **7 Claims**

1. A method of producing, from input data, pixels having depth components determined by linearly interpolating the integer values of a dependent variable Z representing pixel ordinal position along a depth axis, Z ranging from a given starting ordinal position of value Zs to a given ending ordinal position of value Ze, the interpolating of Z done as an independent variable Z representing pixel ordinal position along a scan line traverses an ordered sequence of integers starting with a value Xs representing a starting ordinal position along the scan

line and ending with a value Xe representing an ending ordinal position along the scan line, thus producing a sequence of (X, Z) pairs describing as ordinal positions the physical locations of pixels along the scan line and their associated depths, the method comprising the steps of:

a. finding the ordinal position differences ($Z=Ze-Zs$ and $X=Xe-Xs$;

b. finding an integer quotient Mi and a remainder R by dividing Z by X;

c. multiplying the value of R by two to obtain a scaled fractional part Mf;

d. assigning the initial values Mf− X to a term Zf and Zs to a term Zi;

e. assigning the value Xs to a term X;

f. taking (Xs, Zs) as the first pair in a sequence of (X, Z) pairs, each of which pairs describes the ordinal position along a scan line of a pixel whose ordinal position along a depth axis is Z;

g. replacing the value of X with the next value in the ordered sequence of integers;

h. determining if Zf is greater than or equal to zero;

i. if the outcome in step h is that Zf is greater than or equal to zero then:

j. adding Mi+1 to Zi; and also

k. adding Mf−2 X to Zf;

l. if the outcome in step h is that Zf is less than zero, then:

m. adding Mi to Zi; and also

n. adding Mf to Zf;

o. taking (X, Zi) as the next pair in the sequence of (X, Z) pairs;

p. repeating steps g through o until they have been performed with X equal to Xe;

q. generating a scan line composed of pixels whose ordinal positions thereon and on the depth axis are determined by the sequence of (X, Z) pairs; and

r. illuminating each pixel in the scan line of step q, by an amount ranging from fully on to fully off, the amount determined in accordance with the Z component of that pixel's (X, Z) pair.

5,025,406

ADAPTIVE DIGITAL FILTER FOR MULTI PATH DISTORTION CANCELLATION

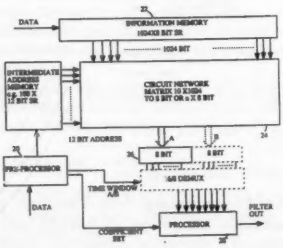
Otto Klank, Lehrte-Arpke, and Dieter Rottmann, Hanover, both of Fed. Rep. of Germany, assignors to Deutsche Thomson-Brandt GmbH, Ullingen-Schweinningen, Fed. Rep. of Germany

Filed Dec. 7, 1989, Ser. No. 447,279

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1988, 3841268

Int. Cl.[5] G06F *15/31*

U.S. Cl. 364—724.19 **10 Claims**



1. An adaptive filter comprising:

a source of signal to be filtered;

shift register means for serially loading said signal and providing parallel output samples at parallel output terminals;

matrix means coupled to said parallel output terminals, and responsive to control signals, for providing groups of predetermined ones of said output samples to respective matrix output terminals;

processing means, coupled to said matrix means, for generating as an output signal, sums of products of said ones of said output samples and predetermined coefficients;

preprocessor means, responsive to said source of signal, for generating filter coefficients for each samples provided by said shift register means and providing as said predetermined coefficients only coefficients having values which exceed a predetermined value, and providing control signals corresponding to samples for which coefficients exceed said predetermined value.

5,025,407

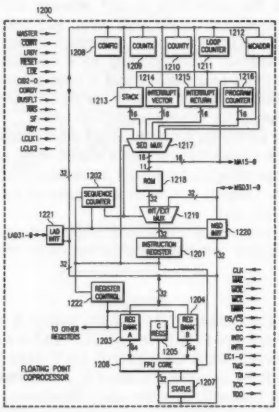
GRAPHICS FLOATING POINT COPROCESSOR HAVING MATRIX CAPABILITIES

David W. Gulley, and Jerry R. Van Aken, both of Sugar Land, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 28, 1989, Ser. No. 387,459

Int. Cl.[5] G06F *7/52*

U.S. Cl. 364—754 **14 Claims**



1. A coprocessor comprising:

a bus for communicating data to and from an external source;

a plurality of registers for the acceptance of data from either an internal or an external source via said bus;

a processing unit;

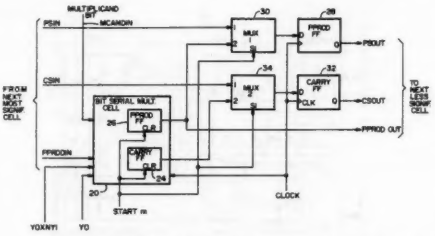
a memory containing coded instructions for controlling said processing unit, said coded instructions operable for moving data in and out of said registers and to and from said bus during the performance of any of said coded instructions; and

a circuit operable in response to institution of a particular set of said coded instructions upon receipt of a single instruction via said bus for providing matrix calculations on data stored in said plurality of registers where certain intermediate results are stored in said registers while other intermediate results remain within said circuit available for subsequent use, thereby reducing the number of storage registers required during any matrix arithmetic operation.

5,025,408
BIT SERIAL MULTIPLIER WITH PARALLEL-IN-SERIAL-OUT CARRY AND PARTIAL PRODUCT SHIFT REGISTERS

David L. Sherman, Fremont, Calif., assignor to Shographics, Inc., Mountain View, Calif.

Filed Jul. 31, 1989, Ser. No. 387,601
Int. Cl.[5] G06F 7/52
U.S. Cl. 364—759 8 Claims



1. A bit serial multiplier for pipelined operation comprising:

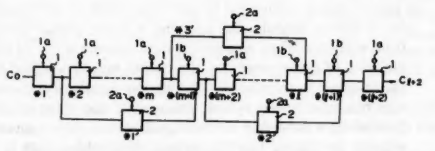
first means including a plurality of cells and including a plurality of partial product and carry latches for multiplying an N bit multiplier times an M bit multiplicand, where N and M are each any integer, by shifting in the multiplier bits one at a time and multiplying each multiplier bit as said multiplier bit arrives times the multiplicand each bit of which is operated upon in a corresponding cell where each cell generates a partial product bit and a carry bit and stores said partial product and carry bits in corresponding partial product and carry latches for use in the operations on the next multiplier bit to arrive and each cell is coupled to an adjacent cell for shifting out final result bits in serial fashion; and

second means for storing all the partial product bits from said partial product latches in a first shift register, and for storing all the carry bits from said carry latches in a second shift register, said partial product and carry bits being so stored after all N bits of the multiplier have been shifted in, and said second means also for clearing said latches storing said partial product bits and said carry bits after all N of the multiplier bits have been shifted in so as to ready said first means to begin another multiplication with a different multiplier and a different multiplicand, and for combining the stored partial product and carry bits to generate the most significant bits of the final product during the clock cycles used to shift the next multiplier into said first means.

5,025,409
CARRY PROPAGATION CIRCUIT OF PARALLEL-TYPE FULL ADDER

Gensuke Goto, Ebina, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 15, 1989, Ser. No. 366,541
Claims priority, application Japan, Jun. 15, 1988, 63-147821
Int. Cl.[5] G06F 7/50
U.S. Cl. 364—786 9 Claims



1. A carry propagation circuit of a parallel-type full adder having a plurality of bits, said carry propagate circuit comprising:

control means for controlling a carry propagation;

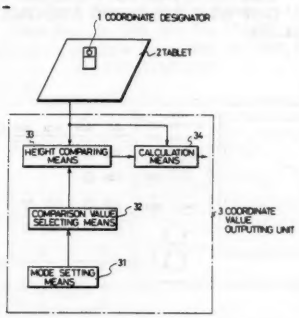
a main path including a plurality of transfer circuits having input and output ends and serially connected at corresponding nodes, each said main path transfer circuit being provided for a respective bit of said plurality of bits and transferring a carry signal from a lower bit to a higher bit when said control means brings said main path transfer circuit to an ON state; and

at least one bypass arranged to bypass a predetermined number of said transfer circuits of said main path and each said bypass comprising a transfer circuit having input and output ends, said control means selectively bringing said bypass transfer circuit to an ON state or an OFF state, said output end of said bypass transfer circuit and an output end of a main path transfer circuit corresponding to the highest bit among bits to be bypassed in the main path are coupled to an identical said node and, when said control means brings said bypass transfer circuit to the ON state and propagates a carry signal thereby to the higher bit side, it brings said main path transfer circuit provided immediately in the lower bit side of said main path, as seen from the identical node, to the OFF state and prevents a carry signal from being generated from said OFF state transfer circuit.

5,025,410
COORDINATE READING APPARATUS

Yoshiyuki Morita, Tokyo, Japan, assignor to Seiko Instruments, Inc., Tokyo, Japan

Filed Aug. 11, 1988, Ser. No. 233,263
Claims priority, application Japan, Aug. 12, 1987, 62-201487
Int. Cl.[5] G02B 7/14; G08C 21/00; G09G 3/00
U.S. Cl. 364—900 6 Claims



1. A coordinate reading apparatus for inputting coordinate data to a computer and operable in a selected one of a relative coordinate mode and a second mode, said apparatus comprising: a first member constituting a tablet defining a coordinate surface; a second member in the form of a coordinate designator movable across said surface so that a distance exists between said designator and said surface; position signal producing means associated with said members for producing a plurality of induced signals each inversely proportional to the distance between said designator and said surface so that one of the induced signals will have a value greater than the value of each other induced signal so that the value of the one of the induced signals will be a maximum induced signal value relative to the values of all of the induced signals; and coordinate value outputting means connected to said position signal producing means for producing coordinate value output signals representative of the coordinate value of the point designated by said designator, wherein said outputting means comprise:

mode setting means responsive to a setting operation for

generating a control signal indicative of the relative coordinate mode;

selecting means for producing a first signal representing a predetermined value in the absence of the control signal, and responsive to the control signal for selectively producing, in place of the first signal, a second signal representing a value greater than the predetermined value;

comparator means connected to said position signal producing means and to said selecting means for comparing the maximum induced signal value produced by said position signal producing means with the signal being produced by said selecting means and producing a comparison signal when the maximum induced signal value exceeds the value represented by the signal being produced by said selecting means; and

coordinate value calculating means connected to said position signal producing means and to said comparator means for producing a coordinate value output signal from the induced signal value occurring in the time coincidence with the comparison signal.

5,025,411

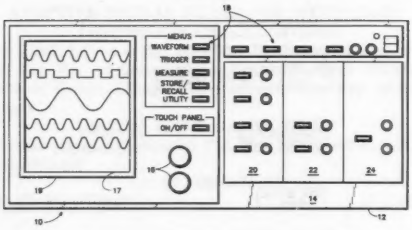
METHOD WHICH PROVIDES DEBOUNCED INPUTS FROM A TOUCH SCREEN PANEL BY WAITING UNTIL EACH X AND Y COORDINATES STOP ALTERING

James L. Tallman, Hillsboro, and Terry G. Sherbeck, Aloha, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Dec. 8, 1986, Ser. No. 939,645

Int. Cl.[5] G06F *3/037, 3/033;* **G09G** *1/16;* **G06K** *11/06*

U.S. Cl. 364—900 **2 Claims**



1. For an instrument comprising a computer, means for producing a plurality of output signals, and interface means for storing data indicating the states of said output signals, for transmitting and interrupt signal to said computer whenever the state of any one of said output signals changes, and for transferring said data to said computer, a method for said computer for acquiring and responding to said data, the method comprising the steps of:

a. acquiring said data stored by said interface means upon each receipt of said interrupt signal, and setting the value of a first parameter to represent the state of at least one of said plurality of output signals as indicated by said data;

b. concurrently with performing step a, periodically determining whether the value of said first parameter has remained constant for a predetermined period; and

c. initiating a selected action after the first parameter is determined in step b to have remained constant for said predetermined period, said action being selected according to the value of said first parameter.

5,025,412

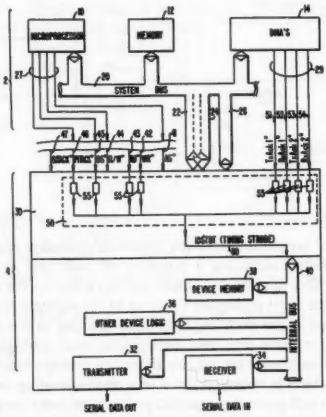
UNIVERSAL BUS INTERFACE

Monte J. Dalrymple, Fremont; Phillip D. Verinsky, San Jose, and Don Smith, Los Gatos, all of Calif., assignors to Zilog, Inc., Campbell, Calif.

Filed Feb. 17, 1988, Ser. No. 157,294

Int. Cl.[5] G06F *13/36*

U.S. Cl. 364—900 **6 Claims**



1. A universal bus interface for interfacing a peripheral device via a bus with a current microprocessor system, the current microprocessor system being any one from a predetermined group of microprocessor systems, each microprocessor system in the predetermined group having a set of strobe signals for timing bus transactions, each strobe signal being in either an asserted state or an unasserted state and at any one time at most one strobe signal among the set of strobe signals of the current microprocessor system is being asserted, said bus interface comprising:

a plurality of input means, each corresponding to and responsive to a possible strobe signal among the predetermined group of microprocessor systems, such that those input means not corresponding to and not connecting to the current microprocessor are at the unasserted state, and those input means corresponding to and connecting to receive the strobe signals of the current microprocessor system are driven by the strobe signals according to the states thereof;

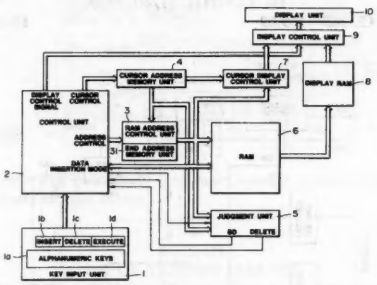
a plurality of driver modules, each having an input end adjacent and connected to a corresponding input means, and an output end, each of said driver modules responsive to the state at its input end and the state at its output end for driving the output end (1) to the asserted state when the input end is at the asserted state and the output end is at the unasserted state, (2) to the unasserted state when the input end is at the unasserted state and the output end is at the asserted state, and (3) to an electrically floating state when the input end is at the unasserted state and the output end is at the unasserted state; and

an output means connected to the output ends of the plurality of driver modules for deriving a strobe signal therefrom such that when an asserted state appears at one of the plurality of driver modules, the output means is pulled to the asserted state, whereby the strobe signals of the current microprocessor system received at the input means producing a universal strobe signal at the output means suitable for timing bus transactions or strobing data in a peripheral device without a system clock.

5,025,413
DATA PROCESSING APPARATUS INCLUDING A DELETE FUNCTION

Kohei Genda, and Kazuaki Murai, both of Fussa, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Mar. 3, 1989, Ser. No. 319,142
Claims priority, application Japan, Mar. 8, 1988, 63-29853[U]
Int. Cl.[5] G06F *3/153*
U.S. Cl. 364—900 **6 Claims**



1. A data processing apparatus comprising:

data input means for inputting data items to be displayed;

memory means having a plurality of storage areas for storing data items entered by said data input means;

display means having a plurality of display areas for displaying said data items stored in said memory means, each of said display areas displaying a data item stored in a storage area of said memory means;

cursor means including designating means for designating said storage areas of said memory means, and means for displaying a cursor on a display area of said display means which corresponds to said designated storage area;

cursor detecting means for determining which of said storage areas is designated by said cursor means to thereby determine at which display area of said display means said cursor is displayed;

delete-command input means for inputting a delete-command for commanding deletion of a data item displayed on said display means and stored in said memory means; and

deleting means, responsive to the delete-command input from said delete command input means, for deleting one of a data item stored in said storage area designated by said cursor means and a data item stored in said storage area located before said storage area designated by said cursor means, in response to a detecting result obtained by said cursor detecting means indicating the location of said cursor on said display means.

5,025,414
SERIAL BUS INTERFACE CAPABLE OF TRANSFERRING DATA IN DIFFERENT FORMATS

Shinichi Iwamoto, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

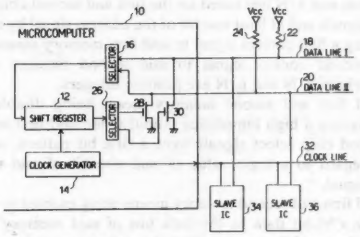
Filed Nov. 6, 1987, Ser. No. 117,738
Claims priority, application Japan, Nov. 6, 1986, 61-265153
Int. Cl.[5] G06F *1/00*
U.S. Cl. 364—900 **9 Claims**

1. A master processor for use in a serial data transfer system, the master processor being interconnected to at least first and second slave devices through the same single serial clock line, the master processor being interconnected to the first slave device through a first serial data line and the master processor being interconnected to the second slave device through a second serial data line, the master processor comprising:

a shift register commonly receiving and transmitting serial data transferred from and to be transferred through the first and second serial data lines,

a first selector, coupled to a serial input of the shift register, capable of selectively coupling the serial input of the shift register to either one of the first and second serial data lines,

a second selector, coupled to a serial output of the shift register, capable of selectively coupling the serial output of the shift register to either one of the first and second serial data lines, and

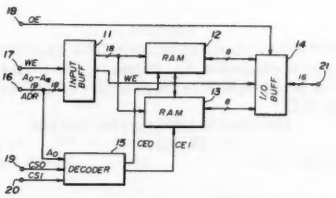


a clock generator, coupled to the single serial clock line, capable of generating a clock pulse in at least two different transfer formats which are different from each other in the number of clock pulses to be supplied to the shift register, the clock generator operating to output to the single serial clock line a clock pulse in accordance with a format utilized by one of the first and second serial data lines selected by either the first selector or the second selector.

5,025,415
MEMORY CARD

Masaru Masuyama, Sagamihara; Yoshihiro Takemae, Tokyo; Tetsuhiko Endoh, Inagi; Hirosuke Komyoji, Minokamo; Ryuji Tanaka, Kawasaki, and Katsuhiko Itakura, Minokamo, all of Japan, assignors to Fujitsu Limited, Kawasaki and Fujitsu Vlsi Limited, Kasugai, both of Japan

Filed Sep. 25, 1989, Ser. No. 412,077
Claims priority, application Japan, Sep. 28, 1988, 63-242950
Int. Cl.[5] G11C *5/06*
U.S. Cl. 365—52 **11 Claims**



1. A memory card for use on a card write and/or read apparatus which has a data bus with an arbitrary bit width and writes and/or reads a datum to and/or from said memory card, said memory card comprising:

data input/output terminal means including data terminal of at least n×N bits;

memory means including a data bus, first memory means for storing data having a bit width n and second memory means for storing data having a bit width n, said data bus of said memory means including n×N bus lines and being connected to said data terminals, said first memory means having n data terminals which are connected to n bus lines out of the n×N bus lines, said second memory means having n data terminals which are connected to other n bus lines out of the n×N bus lines;

address input terminal means for receiving an address signal having a plurality of bits;

first input terminal means for receiving a first chip select

signal for selecting one of said first and second memory means;

second input terminal means for receiving a second chip select signal for selecting one of said first and second memory means; and

decoder means for determining a bit width of the data bus of said memory means to be used for data communication between the card write and/or read apparatus to one of n bits and n/N bits based on the first and second chip select signals and at least one bit of the address signal by supplying a first control signal to said first memory means and a second control signal to said second memory means, where n, N and n/N are positive integers,

said first and second memory means being disabled and having a high impedance output when said first and second chip select signals have a first bit pattern, without regard to a logic value of said one bit of said address signal,

said first and second memory means being enabled to output (n×N)-bit data to the data bus of said memory means when said first and second chip select signals have a second bit pattern, without regard to said logic value of said one bit of said address signal,

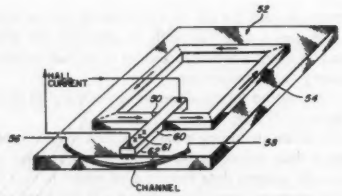
one of said first and second memory means, corresponding to said logic value of said one bit of said address signal, being enabled to output an n-bit data to the data bus of said memory means and the other being disabled and having a high impedance output when said first and second chip select signals have a third bit pattern.

5,025,416

THIN FILM MAGNETIC MEMORY ELEMENTS

Gary A. Prinz, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 1, 1989, Ser. No. 360,173
Int. Cl.[5] G11C *11/14*
U.S. Cl. 365—170 **16 Claims**



1. A thin film magnetic memory element, comprising:

a single crystal substrate; and

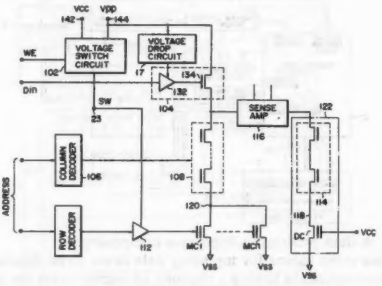
a closure domain on top of said substrate, wherein said closure domain is a single crystal magnetic film which is lattice-matched to said substrate, said closure domain includes a plurality of legs, with each of said legs being oriented along an easy axis of said single crystal magnetic film with said legs joining at domain walls.

5,025,417

SEMICONDUCTOR MEMORY DEVICE CAPABLE OF PREVENTING DATA OF NON-SELECTED MEMORY CELL FROM BEING DEGRADED

Junichi Miyamoto; Nobuaki Ohtsuka, both of Yokohama; Kuniyoshi Yoshikawa, and Seiichi Mori, both of Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 4, 1989, Ser. No. 444,998
Claims priority, application Japan, Jan. 13, 1989, 1-6213
Int. Cl.[5] G11C *11/40, 13/00*
U.S. Cl. 365—189.09 **13 Claims**



1. A semiconductor memory device comprising:

a memory cell constructed by a MOS transistor having a floating gate, a control gate and a drain, for storing data;

power source switching means for selectively supplying as a power source potential one of first and second power source potentials in accordance with an input write-in control signal;

a gate potential control circuit for generating a first output in accordance with the power source potential from said power source switching means and supplying a first output to said control gate of said memory cell;

drain potential control means for generating a second output in accordance with a lowered potential supplied thereto and outputting the second output to said drain of said memory cell; and

power source potential lowering means for lowering the second power source potential by a preset value to obtain the lowered potential and supplying the lowered potential to said drain potential control means.

5,025,418

SEMICONDUCTOR DEVICE FOR PERFORMING AUTOMATIC REPLACEMENT OF DEFECTIVE CELLS

Syoichi Asoh, Oita, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 23, 1990, Ser. No. 468,880
Claims priority, application Japan, Feb. 2, 1989, 1-24548
Int. Cl.[5] G11C *8/00*
U.S. Cl. 365—200 **8 Claims**

1. A semiconductor device comprising:

main storage means for storing data;

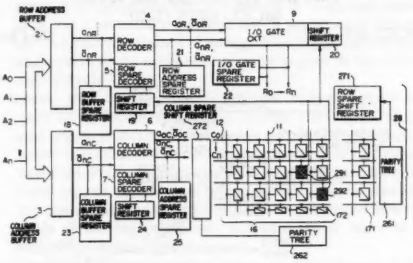
spare storage means disposed in association with said main storage means so as to serve as a redundancy circuit for replacing a defective element of said main storage means;

temporary storage means disposed in association with said main storage means to store said data temporarily;

comparing means for comparing the data stored in said main storage means with the data stored in said temporary storage means to output a comparison result; and

switching means coupled to said main storage means and

said spare storage means and responsive to the comparison result output from said comparing means for replacing the



defective element of said main storage means with said spare storage means.

5,025,419

INPUT/OUTPUT CIRCUIT

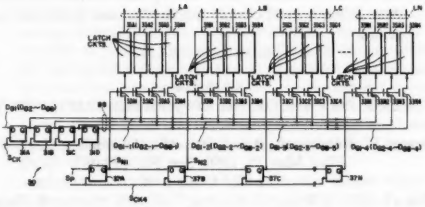
Yoichi Nishino, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 30, 1989, Ser. No. 331,275

Claims priority, application Japan, Mar. 31, 1988, 63-079558; Jul. 25, 1988, 63-185995

Int. Cl.[5] G11C *19/00;* **H03K** *17/56;* **G06M** *1/22;* **H02H** *3/20*

U.S. Cl. 365—221 **7 Claims**



1. An input/output circuit comprising:

a first data line including a plural number of first unit data lines;

a second data line including plural sets of second unit data lines, each set of second unit data lines being formed of an equal number of lines as the number of first unit data lines forming the first data line;

switch means for selectively coupling the first unit data lines with corresponding ones of the second unit data lines;

latch circuits provided between the switch means and the second data line; and

control means for controlling the switch means to turn on, such that at least one set of the second unit data lines of the second data line is sequentially coupled with the first data line.

5,025,420

PORTABLE SEMICONDUCTOR MEMORY DEVICE

Masatoshi Kimura, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jan. 16, 1990, Ser. No. 465,497

Claims priority, application Japan, Nov. 2, 1989, 1-284855

Int. Cl.[5] G11C *11/40*

U.S. Cl. 365—230.01 **4 Claims**

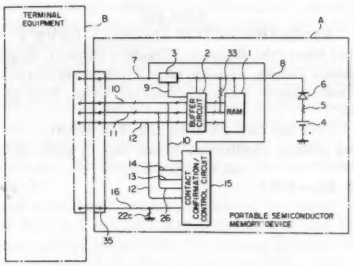
1. A portable semiconductor memory device comprising:

an internal memory for storing data;

an address bus, a control bus, and a data bus which are connected to said internal memory;

a connector for electrically connecting said address bus, said control bus, and said data bus to terminal equipment; and

a contact confirmation/control circuit connected to said address bus, said control bus, and said data bus and storing at least one known digital data word for outputting the known digital data word to said data bus when a read control signal input to said contact confirmation/control circuit from the terminal equipment over said control bus



with a given address specified on said address bus is received, thereby indicating proper connection of said connector to the terminal equipment and for not outputting the known data word to said data bus when a read control signal is input from the terminal equipment over said control bus with a given address is specified on said address bus but is not received, thereby indicating trouble in the connection of said connector to the terminal equipment.

5,025,421

SINGLE PORT DUAL RAM

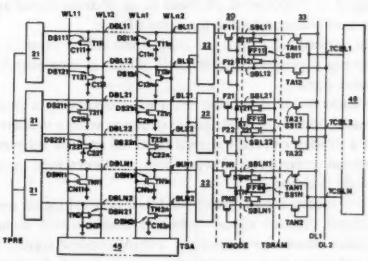
Gyung Y. Cho, Dong-A Apt. 25-1403, Bupyung 1-Dong, Buk-Ku, Inchon, Rep. of Korea

Filed Jan. 2, 1990, Ser. No. 459,887

Claims priority, application Rep. of Korea, Jan. 9, 1989, 89175

Int. Cl.[5] G11C *13/00*

U.S. Cl. 365—230.05 **9 Claims**



1. In a semiconductor memory device comprising one or more than one storage array, each of said storage array(s) including a plurality of bit lines, and an input/output port connected to said plurality of bit lines by gate means for access to said storage array, wherein each of said bit lines comprising:

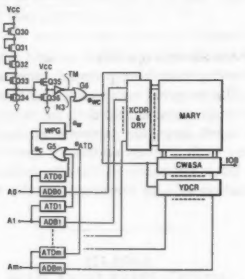
one or more than one DRAM bit line, each of said DRAM bit line(s), including a plurality of dynamic type storage elements, each of said dynamic type storage elements having a storage capacitor means for storing data in a binary state;

a SRAM bit line including one or more than one static type storage element, each of said static type storage element(s) having a storage flip flop means for storing data in a binary state; and

an interface means for electrically interconnecting one of

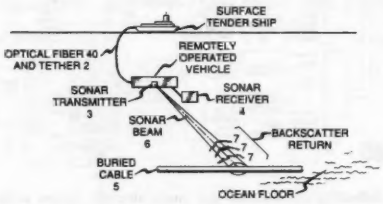
said DRAM bit line(s) to said SRAM bit line or isolating said DRAM bit line(s) from said SRAM bit line.

5,025,422
SEMICONDUCTOR MEMORY DEVICE
Nobuyuki Moriwaki, Kodaira; Mitsuhiro Higuchi, Koganei, and Mitsuhiro Toshita, Kodaira, all of Japan, assignors to Hitachi, Ltd. and Hitachi VLSI Engineering Corp., both of Tokyo, Japan
Filed Oct. 10, 1989, Ser. No. 419,311
Claims priority, application Japan, Oct. 7, 1988, 63-253147
Int. Cl.[5] G11C *7/00*
U.S. Cl. 365—233.5 24 Claims



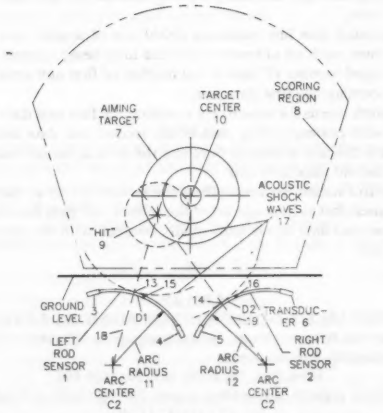
1. A semiconductor memory device comprising:
a plurality of memory cells each respectively coupled to a word line and to a pair of data lines;
read means selectively coupled to said pair of data lines through a switching means for amplifying data from said memory cells;
address transition detecting means for outputting a pulse signal in response to changes in an address signal applied to said semiconductor memory device;
pulse generating means for outputting a first control signal having a predetermined pulse width in response to said pulse signal;
operation mode detection means for detecting a predetermined operation mode in accordance with a voltage level of a predetermined external terminal and for outputting a second control signal when said predetermined operation mode is detected;
control means for receiving said first control signal and said second control signal, wherein said control means includes means for outputting a third control signal; and
first selection means coupled to receive said third control signal and said address signal for selecting a predetermined word line in accordance with said address signal and for activating the selected word line in response to said third control signal,
wherein said outputting means of said control means outputs said third control signal having a predetermined pulse width in response to said first control signal when said operation mode detection means does not detect said predetermined operation mode, and outputs the third control signal in response to said second control signal so that the third control signal is outputted for a period of time longer than said predetermined pulse width when said operation mode detection means detects said predetermined operation mode.

5,025,423
ENHANCED BOTTOM SONAR SYSTEM
Ronald L. Earp, Burlington, N.C., assignor to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Dec. 21, 1989, Ser. No. 454,081
Int. Cl.[5] G01S *15/00*
U.S. Cl. 367—137 26 Claims



1. A system for identifying objects, comprising:
means for transmitting toward a target a first signal comprising a succession of bursts of selected different frequencies;
means for receiving the target backscatter energy created by each successive individual frequency burst of said first signal;
means for collecting as data points over the range of frequencies used, each backscatter signal amplitude value and the associated burst frequency;
a reference library of data point sets, each set predetermined to be representative of the backscatter energy of a particular object when impinged by said first signal; and
means for determining which set of predetermined reference data points is most closely matched to said collected data points.

5,025,424
SHOCK WAVE SCORING APPARATUS EMPLOYING CURVED ROD SENSORS
George W. Rohrbaugh, Rte. 1, Box 454, Alexandria, Pa. 16611
Filed May 21, 1990, Ser. No. 527,057
Int. Cl.[5] G01S *3/80*
U.S. Cl. 367—127 6 Claims



1. An automatic target scoring apparatus for use with moving targets responsive to the airborne first acoustic shock wave of a supersonic projectile for determining the "hit" location at which the projectile passed through the predetermined target area of the moving target, comprising in combination:

an array comprised of two acoustical projectile detection devices, each comprising a first and a second curved acoustic energy translation rod, each translation rod positioned adjacent to the path of said moving target and adapted to intercept said first acoustic shock wave of said supersonic projectile and to transmit through said translation rod a secondary acoustic shock wave, each first and second curved acoustical energy translation device being responsive to an acoustical scoring region in the path of said moving target;

acoustic transducers mounted one on each end portion of each of said curved acoustic energy translation rods in said array, each transducer being respectively responsive to the said secondary acoustic shock waves in said translation rods to produce an electrical output signal, said electrical output signal of each pair of said acoustic transducers having a timed relationship of the difference in arrival times of the said secondary acoustic shock wave at the respective acoustic transducers;

independent electrical circuit means coupled to each pair of said transducers positioned upon said first and said second curved acoustic energy translation rods said circuit being responsive to the electrical signals of the said transducers and providing an output signal which is the measure of the difference in arrival times of said secondary acoustic shock wave through each energy translation rod;

computer means coupled to each electrical circuit means to receive the said time difference of arrival signals produced by each of said acoustic energy translation rods whereby the position of the said supersonic projectile passing through said target area is calculated as the intercept of two straight lines where the first straight line is defined as passing through two points where the first point is the tangent point of contact between said airborne first acoustic shock wave and the first energy translation rod and the second point is the center of curvature point for said first energy translation rod, and the second straight line is defined as passing through two additional points where the first point is the tangent point of contact between said airborne first acoustic shock wave and the second energy translation rod and the second point is the center of curvature point for said second energy translation rod, both rods being in a row to be struck by said airborne acoustic shock wave;

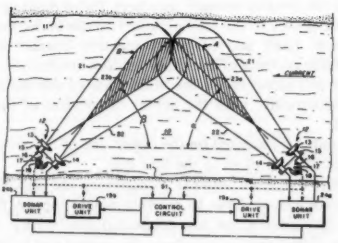
a display means connected to said computer means adapted to represent the "hit" position determined by said computer.

5,025,425

SONIC DETECTION AND TRACKING SYSTEM

Henry Suter, Hatboro, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 30, 1970, Ser. No. 43,616
Int. Cl.[5] G01S *15/00*
U.S. Cl. 367—96 **5 Claims**



1. An object detection system for a desired surveillance region, comprising:

first and second scanning arrays spatially disposed along a first boundary and pivotal in a plane within the surveillance region, each array including a transmitter for generating respective first and second finite beams defining second and third boundaries of the surveillance region and a receiver for accepting the respective reflected signals, said arrays being positioned such that the beams can overlap intermediate said arrays and laterally displaced from the first boundary;

first and second threshold means connected respectively to said first and second arrays receiving the outputs of said receivers for providing first and second alarm output signals when an object is present within said first or second beam respectively;

first and second control means respectively connected to said first and second threshold means for producing a first control signal output when an object is present within said second beam and absent within said first beam, and a second control signal output when an object is present within said first beam and absent within said second beam; and

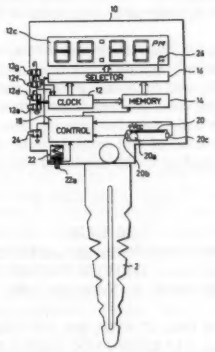
first and second drive means operatively connected between said first and second control means and said first and second arrays respectively for rotating said first array in the presence of the first control signal and said second array in the presence of the second control signal.

5,025,426

REMINDER APPARATUS

Shlomo Blumberg, and Avraham Olti, both of Carmiel, Israel, assignors to Y. M. Shoval Ltd., Haifa, Israel

Filed Jun. 29, 1990, Ser. No. 545,804
Claims priority, application Israel, Nov. 18, 1987, 84520
Int. Cl.[5] G04B *47/00*; E05B *39/04*
U.S. Cl. 368—10 **17 Claims**



1. Reminder apparatus to be carried by a user with a key to remind the user as to the last operation in which the key was used with respect to a lock, comprising:

a real time clock for measuring time;

an operation sensor for sensing the time of the last key operation in which the key was used with respect to the lock;

a memory for storing the time of the last key operation as sensed by the sensor;

a display;

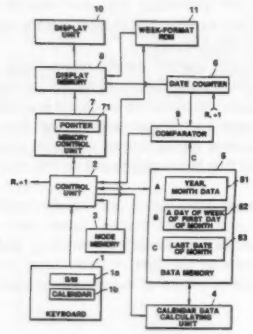
a manually-operable member; and

a control circuit effective, upon manual operation of said latter member, to display in said display the time of the last key operation as stored in said memory.

5,025,427
ELECTRONIC DISPLAY DEVICE FOR DISPLAYING CALENDAR INFORMATION

Yuji Kuriyama, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Apr. 24, 1990, Ser. No. 513,567
Claims priority, application Japan, Apr. 28, 1989, 1-49707[U]
Int. Cl.[5] G04B *19/24*
U.S. Cl. 368—29 13 Claims



1. An electronic device comprising:

display means, having a display screen, for displaying calendar information about at least one month, said display screen including a first display section arranged to display days-of-week information and a second display section, arranged to display date information about a month, having a plurality of display lines, each line having seven display areas;

input means for inputting "year" and "month" data;

calculating means for calculating calendar information base on "year" and "month" data inputted from said input means;

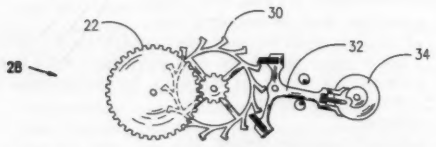
designating means for variably designating a calendar display format defining an arrangement of days of the week; and

control means for controlling said display means to display the calendar information according to the display format designated by said designating means, including means for displaying the days-of-week information on said first display section and means for entering date information into said display areas of said second display section in a manner corresponding to the displayed day-of-week information.

5,025,428
ELECTROMAGNETIC ESCAPEMENT FOR MECHANICALLY DRIVEN WATCH OR CLOCK

Wit Jarochowski, 14603 S. Xenophon Ave., Glenpool, Okla. 74033

Filed Dec. 17, 1990, Ser. No. 628,102
Int. Cl.[5] G04B *15/00;* G04F *1/00*
U.S. Cl. 368—126 4 Claims



1. A clock, watch or other timing device which comprises:

mechanical energy generator means supplying a driving force;

rotatable rotor means engaged with said driving force resulting in rotational force in a radial direction on said rotor;

magnetically permeable stator surrounding said rotor means;

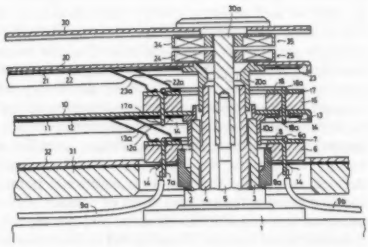
a permanent magnet within said rotor means, said permanent magnet supplying an attractive force on said stator at least as strong as said rotational force to retain or lock said rotor in said position; and

electromagnetic means to periodically induce a magnetic field in said stator to provide a rotational force in said rotor means in the direction of said mechanical generator driving force sufficient to overcome said permanent magnetic force and allow said rotor means to rotate, whereby rotation of said rotor means will be regulated.

5,025,429
ELECTRIC POWER SUPPLY DEVICE FOR HAND WITH LOAD

Isato Watanabe, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan

Filed Dec. 29, 1989, Ser. No. 458,917
Claims priority, application Japan, Dec. 29, 1988, 63-331196
Int. Cl.[5] G04B *19/02*
U.S. Cl. 368—238 15 Claims



1. In a timepiece having hour, minute and second hands each having a drivable load, an electric power supply device comprising:

a fixed contact receiver disposed below the hour hand and having two fixed annular conductors on the upper side of the fixed contact receiver concentrically with the center of rotation of the hands,

a contact receiver secured on the upper side of the hour hand and having two other annular conductors on the upper side of the contact receiver concentrically with the center of rotation of the hands,

a pair of first contact members for supplying electric drive power to the load mounted on the hour hand, the first contact members being disposed on the under side of the hour hand and having respective contact segments slidable on each of the fixed annular conductors,

a pair of second contact members for supplying electric drive power to the load mounted on the under side of the minute hand and having respective contact segments slidable on each of the other annular conductors,

a first coil mounted on the under side of the second hand concentrically with the center of rotation of the hands, and

a second coil mounted on the upper side of the minute hand opposite and close to the first coil,

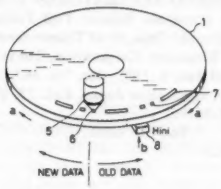
wherein the fixed annular conductors are supplied with electric power from an external power supply, the other annular conductors are connected electrically with the pair of first contact members, the second coil is connected electrically with the pair of second contact members and the first coil is connected electrically with the load on the second hand.

5,025,430

MAGNETO-OPTIC RECORDING AND REPRODUCING APPARATUS INCLUDING A MULTIPLE LAYER RECORDING MEDIUM HAVING A PREMAGNETIZED BIAS LAYER REPLACING AN EXTERNAL BIAS MAGNETIC

Michihiro Takokoro; Kazuo Okada, and Hitoshi Imai, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 31, 1988, Ser. No. 176,152
Claims priority, application Japan, Apr. 3, 1987, 62-83392
Int. Cl.[5] G11B *13/04*
U.S. Cl. 369—13 10 Claims



1. A magneto-optic recording and reproducing apparatus comprising:

a magneto-optic information carrying medium comprising:

a substrate layer for facing a laser beam to be incident thereon for recording or reproducing information on said medium;

a first magnetic layer adjacent said substrate layer;

a second magnetic layer adjacent said first layer;

a third magnetic layer adjacent said second layer, said third magnetic layer being premagnetized in a predetermined uniform direction substantially parallel to said incident laser beam;

said first, second, and third magnetic layers having Curie temperatures designated Tc1, Tc2 and Tc3, respectively, and coercive forces Hc1, Hc2 and Hc3, respectively;

the Curie temperatures of said layers satisfying the relationship $Tc1<Tc2<Tc3$;

the coercive forces of said layers satisfying at least one of the relationships

$Hc1>Hc3>Hc2$, or

$Hc1>Hc2$ and $Hc3>Hc2$;

magnetizing means for generating a magnetic field designated Hini in a direction opposite to said predetermined uniform direction of said third magnetic layer, for controlling the magnetization of the second magnetic layer at room temperature and wherein the intensity Hini of said magnetizing means is related to the coercive forces of said magnetic layers by the expressions:

$Hini<Hc1$, $Hini>Hc2$, and $Hini<Hc3$;

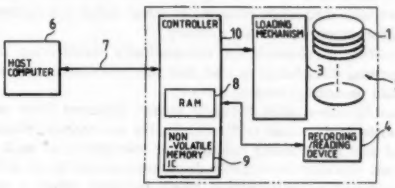
controlling means for controlling said laser beam so that said laser beam can be at one of first, second and third intensities, said first intensity for causing the magnetization on said first, second, and third magnetic layers to remain in previous states and not be affected by rises in temperature in said layers caused by said laser beam, said second intensity for causing the magnetization of the first magnetic layer to be erased by causing the temperature in said first magnetic layer to exceed the Curie temperature Tc1 of the first magnetic layer, but not causing the temperature in said second and third magnetic layers to exceed their respective Curie temperatures, Tc2 and Tc3, so as not to affect the magnetizations of said second and third magnetic layers, and said third intensity for causing the magnetizations of said first and second layers to be erased by causing the temperatures in said first and second magnetic layers to exceed their respective Curie temperatures, Tc1 and Tc2, but not to exceed the Curie temperature Tc3 of said third layer so as not to affect the magnetization of said third layer.

5,025,431

AUTOCHANGER OF WRITABLE DISCS

Ryuichi Naito, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 14, 1988, Ser. No. 243,960
Claims priority, application Japan, Sep. 14, 1987, 62-230196
Int. Cl.[5] G06F *9/46*; G11B *7/00*
U.S. Cl. 369—36 7 Claims



1. An autochanger of writable discs, comprising:

a plurality of writable discs for storing data, wherein each of said writable discs has user areas for storing said data, replacement areas for storing said data upon the occurrence of a defective sector in said user area, and map areas for storing defect management information;

a disc accommodation unit for accommodating, in order, said plurality of discs;

recording/reading device for recording said data into said writable disc and reading recorded data from said writable disc by accessing prescribed addresses of said writable disc while avoiding defective areas of said writable disc by referencing latest defect management information;

a loading mechanism for automatically transferring said writable disc between said disc accommodation unit and said recording/reading device;

a controller for controlling said loading mechanism, said recording/reading device, and erasable non-volatile memory means; and

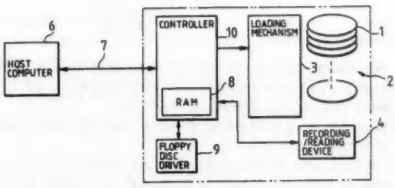
said erasable non-volatile memory means for storing address information of sectors storing said latest defect management information, said stored address information being renewed when a new defective sector is found.

5,025,432

AUTOCHANGER OF WRITABLE DISCS INCLUDING A NON-VOLATILE MEMORY FOR STORING MOST RECENT DEFECT MANAGEMENT INFORMATION RELATING TO THE WRITABLE DISCS

Ryuichi Naito, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 14, 1988, Ser. No. 243,961
Claims priority, application Japan, Sep. 14, 1987, 62-230195
Int. Cl.[5] G11B *17/22*
U.S. Cl. 369—36 8 Claims



1. An autochanger of writable discs, comprising:

a plurality of writable discs for storing data, wherein each of

said writable discs has user areas for storing said data, replacement areas for storing said data in place of a defective sector in said user area, and map areas for storing defect management information, said defect management information including addresses of defective sectors in said writable disc and addresses of replacement sectors corresponding to said defective sectors;

a disc accommodation unit for accommodating, in order, said plurality of discs;

a recording/reading device for recording said data into one of said writable discs which is currently in said recording/reading device and reading recorded data from said writable disc by accessing prescribed addresses of said writable disc while referring to latest defect management information stored in a memory;

a loading mechanism for automatically transferring said writing discs between said disc accommodation unit and said recording/reading device;

erasable non-volatile memory means, different from said writable discs and said memory, for non-volatile storage of said latest defect management information of each of said plurality of writable discs, said stored latest defect management information being renewed when a new defective sector is found; and

a controller for controlling said loading mechanism, said recording/reading device, and said erasable non-volatile memory means, said controller including said memory in which said latest defect management information referred to by said recording/reading device is stored;

wherein latest defect management information stored in said erasable non-volatile memory means corresponding to said writable disc currently in said recording/reading device is stored in said memory of said controller while said corresponding writable disc is in said recording/reading device.

5,025,433

ELECTRO-OPTICAL DEVICE

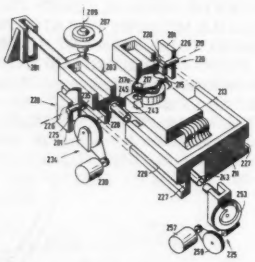
Omar P. L. P. Van Heusden, and Jozef H. M. R. Verheyen, both of Hasselt, Belgium, assignors to U. S. Philips Corporation, New York, N.Y.

Filed Jan. 27, 1989, Ser. No. 303,601

Claims priority, application Netherlands, Feb. 16, 1988, 8800373

Int. Cl.[5] G11B *7/00*

U.S. Cl. 369—44.14 **10 Claims**



1. An electro-optical device for recording and/or reading information in an information plane in an optical record carrier by means of a radiation beam, comprising

a frame carrying a turntable which is rotatable about an axis of rotation,

an optical unit which comprises an objective having an optical axis and which is arranged on a slide which is pivotable about a pivotal axis which is stationary relative to the frame to focus the radiation beam so as to form a radiation spot in the information plane, the pivotal axis extending at least substantially transversely of the plane defined by the optical axis and the axis of rotation,

a slide supporting arrangement and a slide-drive arrangement for moving the objective radially of the turntable between a first position situated near the turntable and a second position which is more remote thereof, and

means for tilting the slide, characterized in that the slide is supported directly in the frame, the slide-supporting arrangement enabling the slide to be moved in a radial direction and to be tilted about said pivotal axis.

5,025,434

TRACKING SERVO APPARATUS OF DISK PLAYER

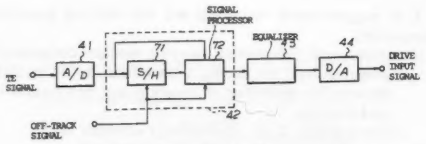
Kiyoshi Tateishi; Haruyasu Sakata; Yuji Tawaragi; Masanori Suzuki, and Takayuki Ohie, all of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jun. 8, 1989, Ser. No. 363,134

Claims priority, application Japan, Jun. 17, 1988, 63-149785; Oct. 20, 1988, 63-264961

Int. Cl.[5] G11B *7/09*

U.S. Cl. 369—44.36 **6 Claims**



1. A tracking servo apparatus having tracking error signal generating means for generating a tracking error signal according to a deviation amount of an information reading spot of a pickup from a recording track in a radial direction of an information recording disk and driving means for driving said information reading spot in the disk radial direction so as to suppress the deviation between the information reading spot and the recording track on the basis of said tracking error signal, the tracking servo apparatus further comprising:

off-track detecting means for detecting whether the information reading spot impinges on the recording track and for generating an off-track signal indicative of a state in which the information reading spot is not on the recording track; and

level control means for increasing an amplitude of the tracking error signal in response to the off-track signal wherein said level control means has holding means for holding a level of said tracking error signal at the instant of time that the off-track signal is generated and outputs the level held in said holding means in response to the off-track signal.

5,025,435

APPARATUS FOR READING OR WRITING CONTRAST ENHANCED INFORMATION OPTICAL RECORD CARRIER

Aartje W. Veenis, and Winslow M. Mimnagh, both of Eindhoven, Netherlands, assignors to U. S. Philips Corporation, New York, N.Y.

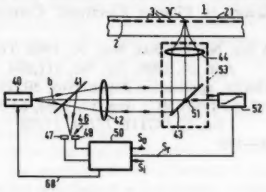
Division of Ser. No. 191,505, May 9, 1988, Pat. No. 4,949,332. This application Jul. 18, 1990, Ser. No. 554,604

Int. Cl.[5] G11B *7/00*

U.S. Cl. 369—48 **4 Claims**

1. Apparatus for reading and/or writing information in a pattern of optically detectable information areas in a record carrier, the apparatus comprising scanning means for scanning a track using a radiation beam, opto-electrical conversion means for converting radiation from the track into an electrical signal, a signal processing circuit for deriving an information signal from the electric signal indicative of the information

recorded in the scanned track, means for deriving a track-width signal from the electric signal, and means for setting the



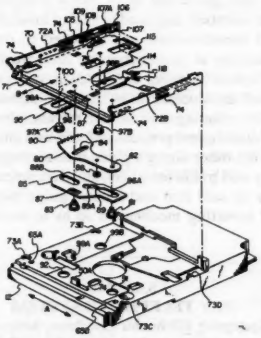
signal processing circuit in response to the derived track-width indication signal.

5,025,436

DISK CARTRIDGE POSITIONING MECHANISM FOR AN INFORMATION STORAGE DISK DRIVE SYSTEM

Ronald A. Crain, San Jose; James D. Harney, Mountainview, both of Calif., and James R. Carey, Rochester, N.Y., assignors to Literal Corporation, Colorado Springs, Colo.

Filed Dec. 20, 1988, Ser. No. 287,806
Int. Cl.[5] G11B *33/02, 17/04*
U.S. Cl. 369—77.2 **6 Claims**



1. Apparatus for positioning a disk cartridge, under power, in an information storage disk drive system comprising:

a mount plate;

cartridge receiving means for receiving and holding a disk cartridge in its own plane, the cartridge having been at least partially manually inserted in a longitudinal direction, said receiving means being mounted above said mount plate to form a planar interstitial space therebetween;

motor actuated linear drive means mounted beneath said mount plate and having a drive tab extending through the mount plate into said interstitial space for providing linear driving motion in a lateral direction normal to said longitudinal direction;

means including a pivoted sector gear mounted in said interstitial space and pivotally responsive to movement of said tab to convert said driving motion from said lateral direction to said longitudinal direction;

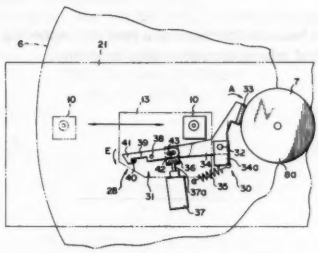
and longitudinal linear drive means at least partially mounted within said interstitial space in engagement with said sector gear and having at least one cartridge contacting member for contacting and moving said cartridge in said longitudinal direction in response to movement of said drive tab in the lateral direction.

5,025,437

INTERLOCKING BRAKING AND LOCK MECHANISMS FOR SCANNING APPARATUS OF AN INFORMATION PROCESSING SYSTEM

Hiroshi Yamashita, Kawasaki; Yoshiaki Tago, and Tomohisa Yoshimaru, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 6, 1989, Ser. No. 306,715
Claims priority, application Japan, Feb. 8, 1988, 63-26792
Int. Cl.[5] G11B *5/54*
U.S. Cl. 369—79 **10 Claims**



1. An apparatus for following a track on an optical information memory disk, comprising:

first drive means, having a spindle motor, for rotating the memory disk;

optical head means, adapted to be adjacent the memory disk when the rotating means is rotating the memory disk, for scanning the information on the memory disk;

means for moving the optical head means in the radial direction of the memory disk, the moving means including a movable member movable in the radial direction of the memory disk, and the moving means supporting the optical head means, the movable member having an engagement portion;

means for electrically braking the first device means to reduce the rotational speed of the spindle motor when the spindle motor power is cut off;

means for mechanically braking the first drive means when the rotational speed is reduced;

lock means for engaging the engagement portion to lock the movable member at a predetermined position when the mechanical braking means is operative to brake the first drive means; and

second drive means for simultaneously driving both the mechanical braking means and the lock means.

5,025,438

RECORDING AND REPRODUCING OPTICAL INFORMATION DEVICE WHICH CONVERTS THE FIRST BEAM INTO A SECOND BEAM HAVING DIFFERENT LIGHT INTENSITY DISTRIBUTION

Masami Emoto, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 9, 1990, Ser. No. 491,176
Claims priority, application Japan, Mar. 17, 1989, 1-64982
Int. Cl.[5] G11B *7/00*
U.S. Cl. 369—112 **6 Claims**

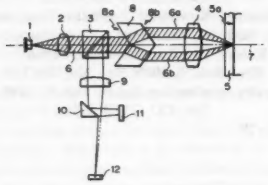
1. An apparatus for recording and reproducing optical information, comprising:

a laser beam source for emitting a laser beam;

a collimator lens in an optical path of said laser beam for collimating said beam to form a first parallel light beam;

a prism arranged symmetrically with respect to an optical axis in an optical path of said first parallel light beam for changing said first parallel light beam to a second parallel light beam having a light intensity distribution in which a light intensity at a peripheral portion of said optical axis is greater than that at said optical axis; and

an objective lens arranged in an optical path of said second parallel light beam for converging said second parallel



light beam in the shape of a spot at a recording face of an optical information recording medium.

5,025,439

METHOD FOR RECORDING AND REPRODUCING OF INFORMATION ON AN OPTICAL DISK OF A PHASE-CHANGE TYPE

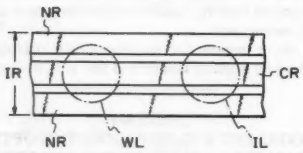
Toshihiro Komaki; Hideo Kudo; Tomonori Ishizuki, and Shinichi Yokozeki, all of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Aug. 26, 1988, Ser. No. 236,913

Claims priority, application Japan, Nov. 24, 1987, 62-295679

Int. Cl.[5] G11B *7/00*

U.S. Cl. 369—100 4 Claims



1. A method for recording and reproducing data on an optical disk of a phase-change type which disk is capable of being over-written while rotating at a speed and being irradiated by a focused light beam as a spot on the disk, which comprises the steps of:

initializing an optical disk through the whole by irradiating an initializing spot to make, in advance of writing, an initialized region on which data is to be written and read;

writing the data in said initialized region by irradiating a writing spot;

over-writing the data by irradiating the writing spot after erasing the written data by irradiating an erasing spot; and reading the written data by irradiating a reading spot;

wherein an amount of optical energy supplied to a unitary area of said optical disk by said initializing spot is larger than that by said writing spot so that a width of said initialized region is wider than that of an area produced by the irradiation of said writing spot.

5,025,440

DUAL SIDE DISC PLAYER HAVING A PICKUP REVERSING MECHANISM

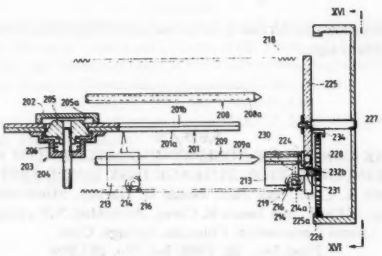
Tadashi Funabashi, and Isami Kenmotsu, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Division of Ser. No. 278,303, Nov. 30, 1988. This application Apr. 20, 1990, Ser. No. 511,884

Claims priority, application Japan, Nov. 30, 1987, 62-303506; Dec. 26, 1987, 62-198782[U]; Jan. 14, 1988, 63-3165[U]

Int. Cl.[5] G11B *17/04, 17/08*

U.S. Cl. 369—199 4 Claims



1. A disc player wherein a carriage carrying pickup means is guided and driven by guide and drive means so as to move along both recording surfaces of a disc so as to play either side of said disc, said guide and drive means comprising: first and second guide members disposed in such a manner that said disc is interposed therebetween, and disposed to detachably support said carriage at predetermined attachment/detachment positions; a holder member for holding said carriage at said predetermined attachment/detachment positions; an inverting mechanism for rotating said holder member from one of the attachment/detachment positions of said first and second guide members to the other along a plane intersecting the directions of guiding by said guide members; and drive means for moving said carriage on said first and second guide members and for driving said inverting mechanism so as to move said holder member.

5,025,441

KEY TELEPHONE SYSTEM

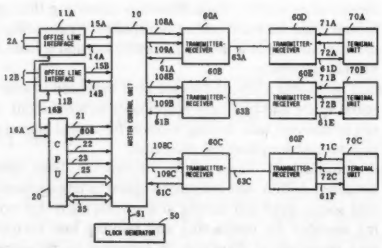
Masaharu Kamigaki; Hironobu Oshikata, both of Tokyo; Yoshihiro Kawata, Saitama; Nobuyasu Shiga, Tokyo; Hideharu Omori, Tokyo; Masayuki Kawashima, Tokyo, and Toshimichi Shimatani, Tokyo, all of Japan, assignors to Iwatsu Electric Company, Ltd., Tokyo, Japan

Filed Dec. 28, 1988, Ser. No. 291,442

Claims priority, application Japan, Dec. 28, 1987, 62-332162; Dec. 28, 1987, 62-332163; Dec. 29, 1987, 62-336654; Dec. 29, 1987, 62-336655; Dec. 30, 1987, 62-336559

Int. Cl.[5] H04J *3/00*

U.S. Cl. 370—77 7 Claims



1. A key telephone system including a master control unit, a

plurality of terminal units connected to said master control unit, a central office line interface for connecting a central office line to said master control unit, and a CPU connected to said master control unit for controlling transmission and exchange for signals in which down-information to be transmitted from said central office line to said terminal units and up-information to be transmitted from said terminal units to said central office line are subjected to PCM communication, wherein:

said master control unit is provided with a central office line communication trunk; and

said central office line communication trunk comprises:

first register for receiving down-information from said central office line interface at a first time to temporarily store said down-information, and for sending out said down-information stored at a second time;

a demultiplexer for sending out said down-information sent out from said first register to said terminal units designated by said CPU;

a multiplexer for receiving up-information from said terminal units designated by said CPU;

a second register for receiving said up-information from said multiplexer at said first time to temporarily store said up-information, and for sending out said up-information stored to said central office line interface at said second time; and

timing generation means for preparing said first time and said second time, in which one frame is constructed by said up-information and said down-information, and a guard time is provided between said up-information and said down-information according to time-delay in transmission of said up-information and said down-information.

5,025,442

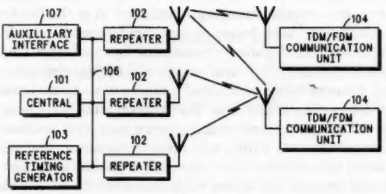
TDM/FDM COMMUNICATION SYSTEM WITH PSEUDO-DUPLEX CAPABILITY

Charles N. Lynk, and Eric R. Schorman, both of Bedford, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 23, 1989, Ser. No. 300,520

Int. Cl.[5] H04L *5/14;* **H04J** *4/00*

U.S. Cl. 370—29 **4 Claims**



1. In a time division multiplexed communication system wherein at least one time slot per TDM frame on at least one communication channel is a system control time slot that is used to substantially support communication control information, a method of providing pseudo-duplex communication between at least a first and second communication unit, comprising the steps of:

(A) transmitting information from said first communication unit in a first time slot wherein the first time slot is assigned to said first communication unit via said system control time slot;

(B) receiving said information by said second communication unit in said first time slot, wherein the reception is terminated by each one of the following conditions:

(i) said first communication unit concludes transmitting, thereby allowing said second communication unit to begin transmitting;

(ii) said first communication unit concludes transmitting, thereby concluding said communication;

(iii) while said first communication unit is transmitting, said second communication unit transmits a talk request signal via said system control time slot, thereby causing said first communication unit to receive a transmit-abort instruction via said system control time slot, thereby allowing said second communication unit to transmit a message to said first communication unit, and said first communication unit to receive said message.

5,025,443

DIGITAL DATA OVER VOICE COMMUNICATION

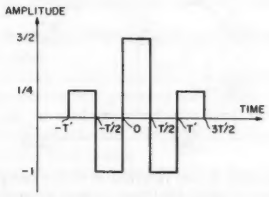
Dev V. Gupta, Flemington, N.J., assignor to Integrated Network Corporation, Bridgewater, N.J.

Continuation of Ser. No. 159,887, Feb. 24, 1988. This application Apr. 28, 1989, Ser. No. 345,472

The portion of the term of this patent subsequent to Aug. 28, 2007, has been disclaimed.

Int. Cl.[5] H04J *1/14*

U.S. Cl. 370—76 **10 Claims**



1. Apparatus for encoding data signals for transmission at a predetermined rate over telephone lines in the presence of voice band telephone signals such that the frequency spectrum of the data signals is substantially removed from the voice band and is shifted to a higher frequency spectrum comprising:

(a) generator means for generating pulsed data signals in bit intervals of duration T;

(b) coding means for forming linear combinations of said pulsed data signals with delayed and advanced version thereof to sinusoidally encode the pulses in the frequency domain by converting each data bit into a corresponding data symbol having a duration 5T/2, the data symbol being composed of five pulses spaced T/2 apart having alternately opposite polarities and equal durations of not more than T/2, the amplitudes of a first pair of pulses on either side of a central pulse being equal and being "a" times an amplitude of the central pulse, where "a" is a factor $\leqq 1$, and the amplitudes of a second pair of pulses on either side of the first pair of pulses being equal and being "b" times the amplitude of the central pulse where "b" is a factor $\leqq 1$.

5,025,444

COMMUNICATIONS ERROR DETECTION SYSTEM

James L. Clayton, and Robert E. Gewin, both of Huntsville, Ala., assignors to Phoenix Microsystems, Inc., Huntsville, Ala.

Filed Apr. 5, 1989, Ser. No. 334,587

Int. Cl.[5] G06F *11/00*

U.S. Cl. 371—34 **3 Claims**

1. A communications error detection system comprising:

a first data transmitter, at point A, and a second data transmitter, at point B, said first transmitter transmitting a data stream from said first data transmitter to said second data transmitter, and said second data transmitter transmitting a data stream to said first data transmitter;

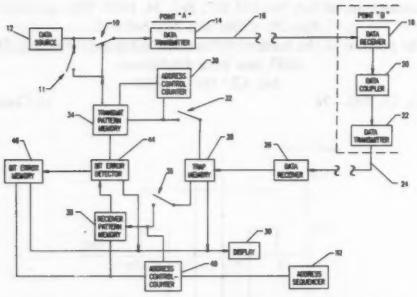
a first data receiver at point A being coupled to receive a data stream from said second data transmitter, and a second data receiver at point B being coupled to receive a data stream from said first data transmitter;

retransmit coupling means for coupling the output of said second receiver to said second transmitter, whereby an

output of said first transmitter is receiver by said second receiver and transmitted back to said first receiver;

sampling means coupled to said first receiver for sampling a selected sample data stream received by said first receiver;

transmitter coupling means including first memory means for storing a said selected sample data stream from said sampling means and selectively applying, as an output, the contents of said first memory means to said first data transmitter, whereby said sample data stream is repeatedly transmitted by said first transmitter;



second memory means responsive to the reception by said first receiver of sample data streams responsive to transmissions of said sample data stream to and from said second transmitter for providing as an output repeated sequences of data in the same sequence format as provided by the output of said first memory means; and

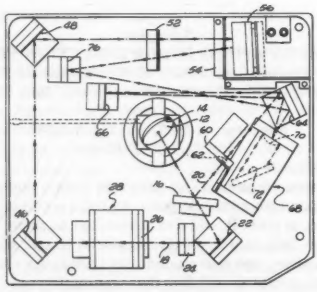
comparator means coupled to said first and second memory means for providing bit-by-bit differences with respect to bit accuracy in the contents of said first and second memories and thereby providing transmission system influenced errors.

5,025,445

SYSTEM FOR, AND METHOD OF, REGULATING THE WAVELENGTH OF A LIGHT BEAM

Stuart L. Anderson, San Diego, and Richard L. Sandstrom, Encinitas, both of Calif., assignors to Cymer Laser Technologies, San Diego, Calif.

Filed Nov. 22, 1989, Ser. No. 440,605
Int. Cl.[5] H01S *3/10*
U.S. Cl. 372—20 **25 Claims**



1. In combination for regulating the output of light from a laser at a particular wavelength,

first means for providing a first optical path

second means responsive to the light in the first optical path for producing first signals representing the wavelength of the light from the laser in a plurality of free spectral ranges,

third means for providing a second optical path from the laser,

fourth means responsive to the light in the second optical path for producing second signals representing the particular one of the free spectral ranges in which the wavelength of the light from the laser occurs, and

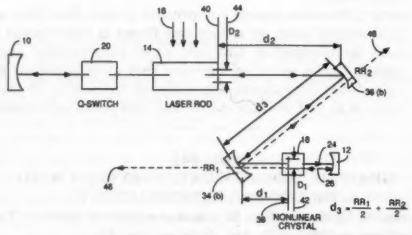
fifth means responsive to the first and second signals for producing third signals to identify the wavelength of the light from the laser.

5,025,446

INTRA-CAVITY BEAM RELAY FOR OPTICAL HARMONIC GENERATION

Dirk J. Kuizenga, Sunnyvale, Calif., assignor to Laserscope, San Jose, Calif.

Continuation-in-part of Ser. No. 176,810, Apr. 1, 1988, abandoned. This application Jan. 23, 1989, Ser. No. 300,389
The portion of the term of this patent subsequent to Mar. 6, 2007, has been disclaimed.
Int. Cl.[5] H01S *3/10*
U.S. Cl. 372—21 **24 Claims**



1. A laser resonator system that comprises: a first and second mirror forming an optical resonator, where said first and second mirrors have radii of curvature R1 and R2 respectively; a laser medium positioned within said optical resonator wherein said laser medium provides gain to a beam of electromagnetic radiation at a certain wavelength, referred to as the fundamental wavelength, said beam at the fundamental wavelength having a diameter D_2 after it passes through said laser medium; an optical element positioned within said optical resonator said optical element being substantially transparent to said beam of electromagnetic radiation at the fundamental wavelength; a means for imaging, positioned between said laser medium and said optical element within said optical resonator, that accepts said beam of radiation with diameter D_2 from said laser medium and images said beam with diameter D_2 to a beam of radiation with diameter d_1 in said optical element such that the ratio of diameters d_2/D_1 depends only on the properties of said means of imaging and said ratio of diameters D_2/D_1 is independent of the position and radii of curvature of said first and second mirrors and is independent of any focusing properties of said laser medium or said optical element.

5,025,447

DRIVE CIRCUIT AND METHOD FOR SETTING A CONTROL SIGNAL OF A SEMICONDUCTOR LASER

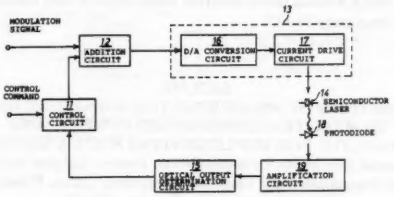
Tsuyoshi Ohashi, Hashima, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Sep. 4, 1990, Ser. No. 577,016
Claims priority, application Japan, Sep. 12, 1989, 1-237584
Int. Cl.[5] H01S *3/10*
U.S. Cl. 372—31 **17 Claims**

1. A semiconductor laser drive circuit comprising:

control means for generating a control signal, where the control signal determines a range of output of the semiconductor laser; and

determination means for determining whether an output of the semiconductor laser is greater than or less than a predetermined value and sending to the control means a determination result indicating whether the output of the semiconductor laser is greater than or less than the predetermined value; wherein



upon receiving an externally provided control command, the control means generates a new control signal based on the determination result by generating a predetermined number of search control signals in a binary-tree search, the new control signal corresponding to the final search control signal.

5,025,448

METHOD AND APPARATUS FOR STABILIZING FREQUENCY OF SEMICONDUCTOR LASER

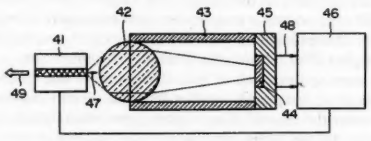
Shoichi Sudo, Atsugi; Yoshihisa Sakai, Yokohama; Hiroshi Yasaka, Zama; Tetsuhiko Ikegami, Tokyo; Yuzo Yoshikuni, Kawasaki; Itaru Yokohama, Zama, and Kenichi Kubodera, Isehara, all of Japan, assignors to Nippon Telegraph & Telephone Corporation, Tokyo, Japan

Filed Mar. 13, 1990, Ser. No. 492,716

Claims priority, application Japan, May 12, 1989, 1-117594; Sep. 27, 1989, 1-0249065

Int. Cl.[5] H01S *3/13*

U.S. Cl. 372—32 **20 Claims**



1. A semiconductor laser apparatus including means for stabilizing the frequency thereof, said apparatus comprising:

a semiconductor laser means for emitting light;

a frequency modulating means for frequency modulating a light output from said semiconductor laser means;

an optical energy absorbing medium for absorbing optical energy, said optical energy absorbing medium being enclosed within a space such that frequency modulated light output from said frequency modulating means is incident on said optical energy absorbing medium;

photodetector means for converting said frequency modulated light transmitted through said optical energy absorbing medium to an electrical signal; and

control circuit means for stabilizing the frequency of light output from said semiconductor laser means in response to said electrical signal output from said photodetector means;

wherein said optical energy absorbing medium comprises acetylene gas enclosed within said space, and wherein among carbon and hydrogen atoms of which molecules of said acetylene as are comprised, at least one atom is of a selected isotope.

5,025,449

OPTICAL PUMPING-TYPE SOLID-STATE LASER APPARATUS WITH A SEMICONDUCTOR LASER DEVICE

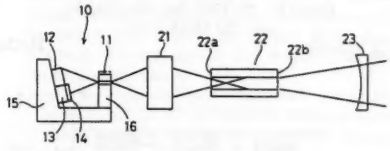
Osamu Yamamoto, and Toshihiko Yoshida, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Japan

Filed Mar. 27, 1990, Ser. No. 500,039

Claims priority, application Japan, Mar. 28, 1989, 1-77824

Int. Cl.[5] H01S *3/133*

U.S. Cl. 372—32 **12 Claims**



1. An optical pumping-type solid-state laser apparatus comprising:

a semiconductor laser device for emitting light from two opposite sides;

a solid-state laser which is optically pumped by laser light with a predetermined pumping wavelength emitted from a first side of said semiconductor laser device and absorbed by the solid-state laser to as to generate laser light with a target wavelength;

a first optical detection means for detecting the amount of laser light emitted from a second side of said semiconductor laser device;

a second optical detection means for detecting the amount of laser light which has been emitted from said second side of said semiconductor laser device and transmitted through a filter means, said filter means selectively absorbing light with the same said pumping wavelength as that of light to be absorbed by said solid-state laser; and

a means for modifying the wavelength of the laser light to be emitted from said first side of the semiconductor laser device in accordance with difference between the amounts of laser light detected by said first and second optical detection means.

5,025,450

SEMICONDUCTOR LASER DEVICE

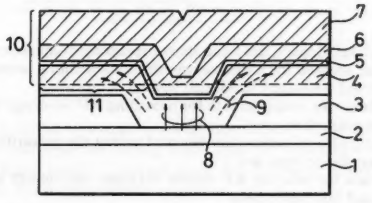
Toshitaka Aoyagi, and Takashi Motoda, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Feb. 21, 1990, Ser. No. 482,507

Claims priority, application Japan, Mar. 27, 1989, 1-75706

Int. Cl.[5] H01S *3/19*

U.S. Cl. 372—46 **14 Claims**



1. In a semiconductor laser structure:

a substrate;

an active layer including a non-planar light-emitting portion supported by said substrate;

lower and upper cladding layers respectively disposed on opposite sides of said active layer; and

a diffusion region produced by diffusion impurities from the side of the device opposite the substrate to a position

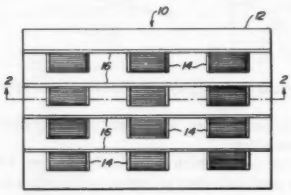
within said lower cladding layer, the impurities forming a pn junction within said lower cladding layer spaced from the light-emitting portion of the non-planar active layer.

5,025,451

TWO-DIMENSIONAL INTEGRATED LASER ARRAY

Michael Jansen, Los Angeles; Moshe Sergant, Culver City; Szutsun S. Ou, Manhattan Beach; Jaroslava Z. Wilcox; Jane J. Yang, both of Los Angeles, and Larry R. Eaton, Huntington Beach, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Oct. 20, 1989, Ser. No. 424,424
Int. Cl.[5] H01S *3/19*
U.S. Cl. 372—50 **16 Claims**



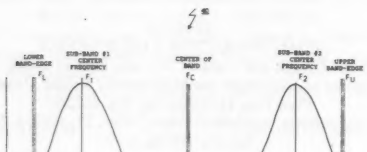
1. A two-dimensional integrated laser array, comprising:
a plurality of surface-emitting laser arrays; and
means for optically coupling the individual laser arrays together such that the laser arrays operate in phase and at the same wavelength to emit coherent beams of light.

5,025,452

FULL-DUPLEX, SUB-BAND SPREAD SPECTRUM COMMUNICATIONS SYSTEM

Harold K. Sohner, Richardson; Joel N. Hoyloak, Lucas; Richard J. Girvin, Plano, all of Tex., and Surinder Kumar, Saskatoon, Canada, assignors to Andrew Corporation, Orland Park, Ill.

Filed Mar. 20, 1990, Ser. No. 496,332
Int. Cl.[5] H04K *1/00*
U.S. Cl. 375—1 **18 Claims**



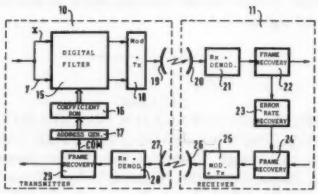
1. A full-duplex, sub-band spread spectrum communications system adapted for radio communications within a prescribed restricted frequency band, said system comprising:
at least one master station for providing RF coverage within a prescribed area;
a plurality of radio units disposed within the prescribed RF coverage area; and
means for relaying RF signals between said master station and said radio units;
said master station and each of said radio units including transmitter means for processing input data and generating spread spectrum signals for being transmitted over said RF signal relaying means; and
receiver means for receiving said transmitted spread spectrum signals from said relaying means and de-spreading said received signals to extract the original data therefrom;
said spread spectrum signals transmitted from said master station to said radio units (the "transmit" signals) being confined to a first frequency sub-band defined within said restricted frequency band, and spread spectrum signals transmitted from said radio units to said master station (the "receive" signals) being confined to a second frequency sub-band which is also defined within said specified frequency band, said first and second frequency sub-bands being defined about different band-edges of said restricted frequency band.

5,025,453

METHOD OF MEASURING THE SIGNATURE OF DIGITAL TRANSMISSION EQUIPMENT, AND APPARATUS FOR IMPLEMENTING SUCH A METHOD

Bertrand Hurinville, Levallois-Perret, France, assignor to Alcatel Transmission par Faisceaux Hertziens, Cedex, France

Filed Dec. 13, 1989, Ser. No. 450,191
Claims priority, application France, Dec. 15, 1988, 88 16558
Int. Cl.[5] H04B *17/00*
U.S. Cl. 375—10 **3 Claims**



1. A method for measuring the signature of digital transmission equipment in a communication link having the digital transmission equipment at a transmission station and receiving equipment at a receiving station, wherein the receiving the equipment continuously provides the digital transmission equipment with an error rate signal, and wherein the measurement is performed during operation without the addition of special equipment, said method comprising the steps of:
(a) transmitting an output signal of a digital filter, said digital filter providing a transfer function responsive to a plurality of coefficients stored in a memory unit coupled to said digital filter, at one of a plurality of frequencies;
(b) varying the depth of fade at said one of said frequencies so as to vary said transfer function of said digital filter under the control of an address generation circuit responsive to the error rate signal, said address circuit being coupled to said memory unit so as to select a group of said coefficients, until an error rate signal equal to a predetermined value is obtained and recording said depth of fade;
(c) selecting another one of said frequencies; and
(d) repeating steps (a) through (c) until said signature is obtained.

5,025,454

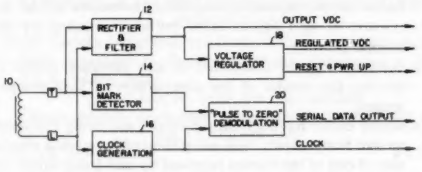
PULSE TO ZERO DIGITAL (PZ) MODULATION

Arthur F. Hogrefe, Laurel, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Filed Jul. 17, 1989, Ser. No. 380,576
Int. Cl.[5] H04L *27/02*
U.S. Cl. 375—41 **10 Claims**

9. A modulation and demodulation method comprising:
modulating a bit mark onto a carrier signal at the start of each "0" in a bit stream to be transmitted;
receiving the modulated carrier and detecting each bit mark;
regenerating the carrier as a logical compatible train of clock counts; and,
decoding the bit mark sequence by outputting a "0" at the

occurrence of each detected bit mark and resetting the output to "1" if a second bit mark has not occurred within



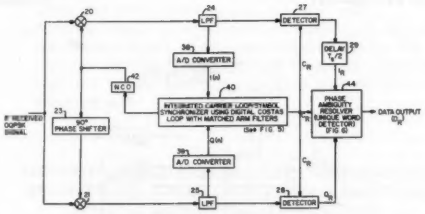
a preset number of said clock counts from the previously detected bit mark.

5,025,455

PHASE AMBIGUITY RESOLUTION FOR OFFSET QPSK MODULATION SYSTEMS

Tien M. Nguyen, Fullerton, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Snace Administration

Filed Nov. 30, 1989, Ser. No. 443,539
Int. Cl.[5] H04L *27/18*
U.S. Cl. 375—53 **4 Claims**



1. In an offset quaternary phase-shift-keyed modulation system for digital communications, wherein unique inphase and quadrature words are separately modulated onto respective inphase and quadrature channels of a preamble before combining the channels to form a quadraphase modulated carrier for transmission of data bits of a quaternary phase-shift-keyed modulated message, and in which a receiver includes means for detecting said inphase and quadrature data channels of the received data from said quadraphase modulated carrier, an improvement in said receiver comprising

means for tracking the phase of said modulated carrier and deriving a synchronization signal, said tracking means comprising a digital Costas loop and an integrated symbol synchronizer, said Costas loop comprising inphase and quadrature accumulators connected to receive data from said means of said receiver for detecting said inphase and quadrature data channels, respectively, said integrated symbol synchronizer being connected to receive the output of said inphase accumulator and produce said synchronizing signal, said integrated symbol synchronizer being connected to provide said synchronizing signal as a feedback to said inphase accumulator and with a delay of one half a bit symbol duration time Ts to a quadrature accumulator for correcting synchronization timing, thereby resolving four-phase ambiguity conditions using the inphase and quadrature channel reversal correcting property of said Costas loop with said integrated symbol synchronizer to correct errors associated with 90° and 270° carrier phase errors, and

a phase ambiguity resolver connected to receive said inphase and quadrature data channels of said tracking means in which 90° and 270° carrier phase errors have been corrected, said phase ambiguity resolver including

unique inphase word detector means and unique quadrature word detector means for separately determining when said unique inphase and quadrature words are received with bits 180° out of phase,

means connected to said unique inphase word detector means and said unique quadrature word detector means for resolving phase ambiguity by separately inverting inphase and quadrature data bits thereby to so complement said bits as to correspond to bits of said unique words, whereby remaining phase ambiguity conditions associated with 0° and 180° carrier phase error are resolved, wherein each of said unique word detector means is comprised of

means for separately correlating said unique inphase and quadrature words received with corresponding unique inphase and quadrature words transmitted, and

means responsive to said means for correlating said unique inphase and quadrature words received for inverting data bits of a corresponding one of said inphase and quadrature data channels received thereafter, and

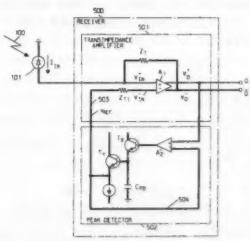
means responsive to said means for separately correlating said inphase and said quadrature phase unique words for generating synchronizing pulses for demodulated data bits received thereafter.

5,025,456

BURST MODE DIGITAL DATA RECEIVER

Yusuke Ota, Mountain Lakes, and Robert G. Swartz, Tinton Falls, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 2, 1989, Ser. No. 305,035
Int. Cl.[5] H04L *25/06*
U.S. Cl. 375—76 **14 Claims**



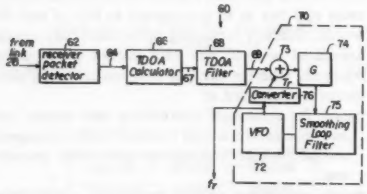
1. A digital data receiver comprising a DC-coupled differential amplifier circuit having a first input for receiving a digital data input signal, a second input for receiving a reference signal, and a data output;

means responsive to said data output for detecting a peak amplitude of said digital data input signal and for generating said reference signal in such a way that said amplifier circuit has a first gain value during the absence of said data input signal and while the data input signal is less than its peak amplitude, and has a second gain value approximately equal to twice the first gain value for a predetermined time after the peak amplitude of the data input signal is reached.

5,025,457
SYNCHRONIZING CONTINUOUS BIT STREAM ORIENTED TERMINALS IN A COMMUNICATIONS NETWORK

Hassan M. Ahmed, Wrentham, Mass., assignor to Codex Corporation, Mansfield, Mass.

Filed Apr. 21, 1989, Ser. No. 341,647
Int. Cl.[5] H04L *7/00*
U.S. Cl. 375—106 **36 Claims**



1. A method for controlling the frequency of a clock for a receiving terminal based on a predetermined clock frequency of a terminal that produces a continuous stream of data at a predetermined frequency for transmission to the receiving terminal over a communications network of the kind in which data is transmitted between the terminals in discrete packets that are delayed on the network by possibly different amounts, comprising:

detecting arrivals of packets that are sent to the receiving terminal,

determining time intervals between the arrivals of successive said packets,

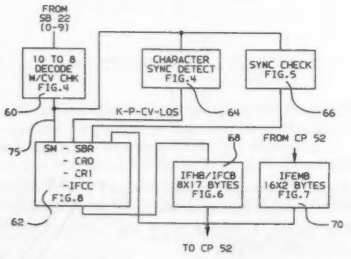
processing said time intervals to generate an estimate that is related to said predetermined frequency, and

controlling said frequency of said receiving terminal clock in response to said estimate.

5,025,458
APPARATUS FOR DECODING FRAMES FROM A DATA LINK

Daniel F. Casper, Poughkeepsie; John R. Flanagan, Staatsburg; Thomas A. Gregg, Highland; Catherine C. Huang, Poughkeepsie, all of N.Y., and Matthew J. Kalos, Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 30, 1989, Ser. No. 429,257
Int. Cl.[5] H04L *7/02;* **H04J** *3/06*
U.S. Cl. 375—114 **13 Claims**



1. Apparatus for decoding frames from a data link, each frame having multiple data characters, said apparatus comprising:

a frame input connected to said data link for the receipt thereon of a received frame from the data link;

an expect/mask buffer, having a first portion for storing a reproduction of expected characters expected to be in said received frame, and a second portion for storing a mask indicating which bits of the characters of said received frame are to be compared to corresponding bits of said expected characters in the first portion;

compare means for comparing characters of said received frame to corresponding expected characters in the first portion of said expect/mask buffer as masked by said second portion;

a compare register connected to said compare means for storing the results of the comparison of said compare means;

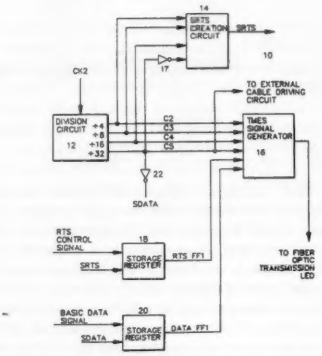
a header buffer having multiple entries and being connected to said frame input, each entry thereof for storing characters of one of the frames received by said frame input; and

a compare buffer having multiple entries and being connected to said compare register, each entry thereof for storing the contents of said compare register resulting from the comparison by said compare means for the corresponding frame entry in said header buffer.

5,025,459
OPTICAL COMMUNICATIONS TRANSMITTER AND RECEIVER

Thomas M. Lill, Port Huron, Mich., assignor to Optical Communications Corp., Silver Spring, Md.

Continuation of Ser. No. 888,203, Jul. 23, 1986, Pat. No. 4,852,128. This application Jul. 24, 1989, Ser. No. 383,537
The portion of the term of this patent subsequent to Jul. 25, 2006, has been disclaimed.
Int. Cl.[5] H04L *25/38, 7/06*
U.S. Cl. 375—117 **6 Claims**



1. A receiver for receiving a transmitted data signal comprised of one or more frames of binary data which occur at a frame rate with each frame having a start pulse of a first time duration which marks the beginning of the frame, a midpoint pulse which marks the midpoint of the frame, and a plurality of bit positions within the frame for transmitting digital data, the midpoint pulse and each bit having a second time duration different than the first time duration comprising:

means for receiving the transmitted frames of the data signal;

means, coupled to the means for receiving the transmitted frames of data for detecting the start pulse within the frames of the transmitted data signal having an output on which the start pulse is produced;

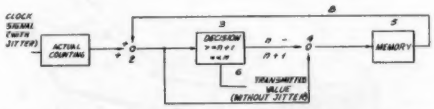
means, coupled to the means for receiving the transmitted frame of data, for detecting the midpoint pulse within the frames of the transmitted data signal and having an output on which the midpoint pulse is produced; and

means for sampling the bit positions, coupled to the start pulse and the means for detecting the midpoint pulse, which samples the bit position at fixed time intervals keyed to the start pulse and the midpoint pulse.

5,025,460
SYSTEM AND CIRCUITS FOR THE PROCESSING AND TRANSMISSION OF A CLOCK SIGNAL, IN PARTICULAR OF THE VIDEO SYNCHRONIZATION FREQUENCY

Silvio Cucchi, Gaggiano, and Stefano Carbone, Milan, both of Italy, assignors to Telettra-Telefonia Elettronica e Radio S.p.A., Milan, Italy

Filed Jun. 14, 1989, Ser. No. 365,846
Claims priority, application Italy, Jun. 14, 1988, 20952 A/88
Int. Cl.[5] H04B *1/10*
U.S. Cl. 375—118 **9 Claims**



1. A method for the processing and transmission of a clock signal affected by jitter, said clock signal having a period 1Fsr, where Fsr is the frequency of the clock signal, by measuring said period with a sample signal having a frequency Fc, said method comprising the steps of:

taking a discrete binary measurement of the ratio Fc/Fsr;

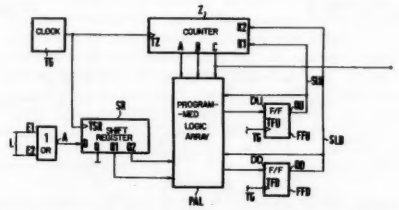
processing said discrete binary measurement of the ratio Fc/Fsr to compress and discharge the jitter in the signal by using a circuit with a feedback loop to feed back error introduced by the jitter and thereby accumulate and integrate said error introduced by the jitter; and

generating a single binary digit 0 or 1 based upon the sum of the discrete binary measurement of the ratio Fc/Fsr and the error fed back by said feedback loop, said single binary digit 0 to 1 adequately representing each period of the clock signal.

5,025,461
METHOD OF AND CIRCUIT ARRANGEMENT FOR RECOVERING A BIT CLOCK FROM A RECEIVED DIGITAL COMMUNICATION SIGNAL

Dieter Pauer, Frieberg, Fed. Rep. of Germany, assignor to Alcatel N.V., Amsterdam, Netherlands

Filed Jun. 5, 1989, Ser. No. 362,802
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1988, 3818843
Int. Cl.[5] H04L *7/033*
U.S. Cl. 375—119 **5 Claims**



1. Method of recovering a bit clock signal from pulses of a digital communication signal received at a receiving end of a transmission path, said method comprising the steps:

generating a reference clock at the receiving end whose frequency is N times a nominal frequency of the bit clock,

using the reference clock to cyclically increment a counter having at least N count states so as to divide the reference clock down to the frequency of the bit clock, such that an output of the counter provides an effective pulse edge of the bit clock signal at count state N/2,

using a phase evaluation logic circuit to determine a first count state of said counter at which a leading edge and a second count state of said counter at which a trailing edge of each received pulse of the communication signal respectively occur,

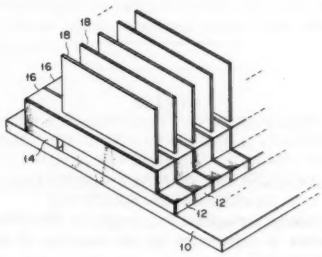
determining a respective center count state of said counter corresponding to said each received pulse, said center count state being equal to the average of said first and second count states, and

for said each received pulse, delivering a phase correction signal to the counter only if the thus determined center count state is not equal to said count state N/2.

5,025,462
X-RAY DETECTOR HAVING FUNCTION OF COMPENSATING FOR SENSITIVITY OF SCINTILLATOR

Yasuo Saito, Nishinasunomachi; Seiji Fujimoto, Ootawara; Yasuo Nobuta, Nishinasunomachi, and Masahiko Yamazaki, Ootawara, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 19, 1990, Ser. No. 540,328
Claims priority, application Japan, Jun. 21, 1989, 1-158801
Int. Cl.[5] G01N *23/00*
U.S. Cl. 378—19 **18 Claims**



1. An X-ray CT scanner device comprising:

means for irradiating X-rays to an object;

scintillator means for receiving X-rays passing through the object and generating scintillation light corresponding to the received X-rays;

photoelectric converting means for receiving the scintillation light and generating an electric signal corresponding to the received scintillation light;

means for processing an output of said photoelectric converting means to produce a tomographic image; and

means, operated in connection with the operation of said X-ray irradiating means, for projecting light to said scintillator means when X-rays are not irradiated on said scintillator means.

5,025,463
X-RAY CT SCANNER DEVICE

Yasuo Saito, Tochigi; Mitsuru Yahata, Ootawara; Kouji Honjo, Funabashi, and Takayuki Matsubayashi, Tochigi, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 20, 1990, Ser. No. 540,601
Claims priority, application Japan, Jun. 21, 1989, 1-158803
Int. Cl.[5] G01N *23/00*
U.S. Cl. 378—19 **14 Claims**

1. An X-ray CT scanner device comprising:

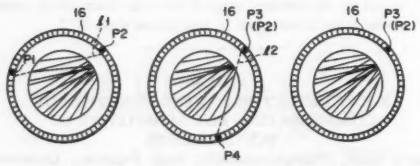
means for irradiating X-rays in a sector form to an object;

X-ray detection means including a plurality of detector modules each having a preset number of detectors and disposed to completely surround the object, for detecting the X-rays which have passed through the object;

first reconstruction means for subjecting outputs of all of said detector modules of said X-ray detection means to a

reconstruction process to create a first tomographic image;

means for detecting a defective detector module based on the first tomographic image created by said first reconstruction means; and



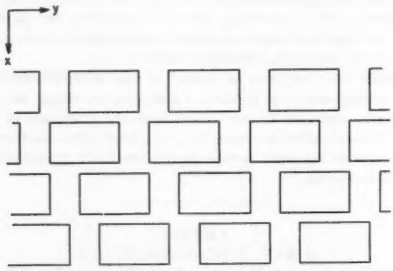
means for subjecting outputs of those of said detector modules which are not a defective detector module to a reconstruction process to create a second tomographic image when the at least one defective detector module is detected.

5,025,464

PSEUDO-RANDOM SUPPORT STRUCTURE FOR TRANSMISSION GRATINGS

John F. Meekins, Springfield, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 15, 1990, Ser. No. 498,249
Int. Cl.[5] G21K *1/06*
U.S. Cl. 378—84 **5 Claims**



3. A method of substantially eliminating the artifacts generated by the support structure matrix in a transmission grating diffraction plane comprising the steps of:

preparing a grating of equidistantly spaced wires;

structurally supporting said wires with a matrix of horizontal bars and vertical supports arranged so as to form a plurality of horizontal rows;

spacing the horizontal supports at regular intervals relative to each other;

spacing the vertical bars in a regular pattern relative to each other in each row and in a pseudo-random pattern relative to vertical bars in each of the other rows;

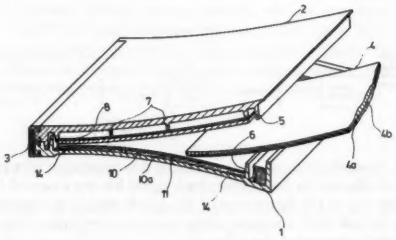
and attaching each of said vertical supports at the ends thereof to adjacent ones of said horizontal bars.

5,025,465

X-RAY CASSETTE FOR FOILS WITH PHOSPHOR LAYER

Walter Bauer, and Roland Müller, both of Muenchen, Fed. Rep. of Germany, assignors to Agfa-Gevaert Ag, Leverkusen, Fed. Rep. of Germany

Filed Oct. 31, 1989, Ser. No. 429,354
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1988, 8814270
Int. Cl.[5] G03B *42/02, 42/04, 5/16*
U.S. Cl. 378—169 **17 Claims**



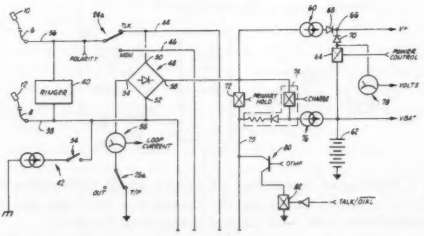
1. An X-ray cassette for foils provided with a stimulable phosphor layer, comprising two cassette parts turnable relative to one another between open and closed positions, one of said cassette parts being permeable for X-rays; means for turnably connecting said cassette parts with one another; means for holding a foil on said X-ray permeable cassette part, said holding means including an X-ray permeable elastic pad arranged on said X-ray permeable cassette part and having a surface facing toward a phosphor layer of a foil inserted into the cassette; and means for protecting the phosphor layer of the foil from mechanical loads and scrapping and including an elastic protective foil applied on said surface of said elastic pad, facing toward the phosphor layer, and having a smooth, wear-resistant outer surface.

5,025,466

TELEPHONE TEST INSTRUMENT

William R. Hilligoss; Lawrence D. Hilligoss, both of Ashland, Oreg.; David Van Winkle, Simi Valley, Calif., and Myron C. Butler, Edmond, Okla., assignors to Communications Manufacturing Company, Los Angeles, Calif.

Filed Mar. 13, 1990, Ser. No. 493,101
Int. Cl.[5] H04M *1/02, 1/24, 19/00*
U.S. Cl. 379—1 **44 Claims**



23. A telephone test instrument, comprising: means for connecting said test instrument to a telephone circuit;

an internal energy supply;

means, connected to said means for connecting, for energizing said instrument from the telephone circuit with a current up to a predetermined current load; and

means, connected to said energy supply, for connecting said energy supply to energize said instrument with additional

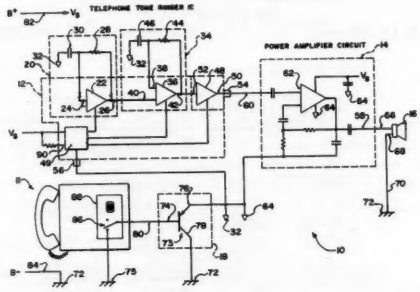
current in response to said instrument requiring current above the predetermined current load.

5,025,467

CELLULAR TELEPHONE RING ANNUNCIATOR

Wayne D. Wheller, Surrey, Canada, assignor to Hescor Canada Ltd., New Westminster, Canada

Filed Feb. 3, 1988, Ser. No. 151,977
Int. Cl.[5] H04M *1/00*
U.S. Cl. 379—60 **13 Claims**



1. An apparatus for producing an audible sound to indicate the occurrence of an incoming telephone call on a cellular telephone, the apparatus comprising:

(a) first means for producing a first waveform having a first voltage and a first frequency;

(b) second means for producing a second waveform, the second means including a voltage to frequency converter, the voltage to frequency converter including a first operational amplifier having a fist inverting input, a first non-inverting input and a first operational amplifier output, a second resistor, means for connecting said second resistor between said first operational amplifier output and said first non-inverting input, a second capacitor, means for connecting said second capacitor between said first non-inverting input and a first signal ground, and wherein said second resistor and said second capacitor have parameters selected so that said second frequency has a nominal value in the range including 508 to 635 Hz;

(c) amplifying means for amplifying said second waveform to produce an amplified waveform, said amplifying means being operably connected to receive said second waveform;

(d) third means for producing an audible sound from said amplified waveform, said third means being operably connected to receive said amplified waveform;

(e) an enable circuit interconnecting the cellular telephone and at least one of the following: said first means, said second means and said amplifying means, said enable circuit being operable to render the apparatus operative to produce said audible sound.

5,025,468

COMPUTERIZED SYSTEM FOR INCOMING CALLS

Parminder S. Sikand, Richmond; Mary J. McAllister, San Anselmo; John Henel, Richmond; Allen L. Jackson, Penngrove, and Karen Bell, Rohnert Park, all of Calif., assignors to Harris Corporation, Melbourne, Fla.

Filed May 4, 1989, Ser. No. 347,531
Int. Cl.[5] H04Q *3/64*
U.S. Cl. 379—67 **39 Claims**

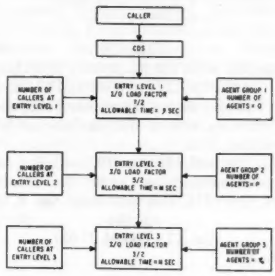
1. A method of queuing callers connected to an automatic call distribution system (ACD). comprising the steps of:

a. establishing a queue for the callers;

b. establishing groups of agents, each of said groups having one or more agents for responding to the said callers;

c. establishing a series of entry levels;

d. establishing a load factor for each of said entry levels related to the respective number of callers, with each of said entry levels arranged in a hierarchy of increasing priority levels, and with said increasing priority levels being indicative of an increased probability an agent will respond to the caller in said queue; and


CALLER
CDS
NUMBER OF CALLERS AT ENTRY LEVEL 1
ENTRY LEVEL 1 I/O LOAD FACTOR 1/2 ALLOWABLE TIME = X SEC
AGENT GROUP 1 NUMBER OF AGENTS = Q
NUMBER OF CALLERS AT ENTRY LEVEL 2
ENTRY LEVEL 2 I/O LOAD FACTOR 3/2 ALLOWABLE TIME = W SEC
AGENT GROUP 2 NUMBER OF AGENTS = P
NUMBER OF CALLERS AT ENTRY LEVEL 3
ENTRY LEVEL 3 I/O LOAD FACTOR 1/2 ALLOWABLE TIME = N SEC
AGENT GROUP 3 NUMBER OF AGENTS = R

e. determining whether the said load factor has been exceeded at any of said entry points;

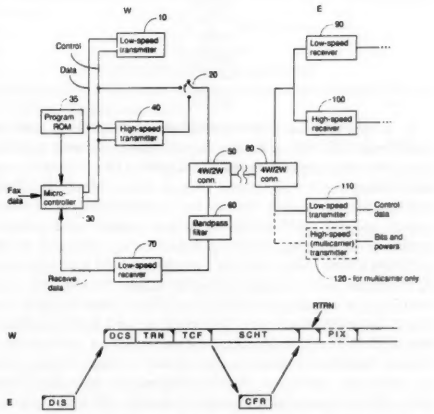
f. moving at least one caller from said entry level where said load factor has been exceeded to the next in said series of entry levels.

5,025,469

METHOD AND APPARATUS FOR REDUCING THE TURN-AROUND TIME IN FACSIMILE TRANSMISSION

John A. C. Bingham, 2353 Webster St., Palo Alto, Calif. 94301

Filed Feb. 6, 1990, Ser. No. 475,455
Int. Cl.[5] H04M *11/00*
U.S. Cl. 379—98 **7 Claims**



5. An apparatus in a device for sending facsimile data via a communication link from a source modem to a destination modem, each having a receiver and a transmitter, using a half-duplex protocol whereby, in sequence, said source modem sends a signal to said destination modem to synchronize and train its receiver, said destination modem sends a command signal back to said source modem, and said source modem sends a resynchronizing and retraining signal followed by data, an apparatus for preventing the re-routing of some sections of said communication link and speeding the resynchronization

and retraining of the receiver of said destination modem, said apparatus comprising:

means for recognizing the beginning and end of the time periods when said source modem is awaiting a response from said destination modem or is receiving and decoding said response; and

means for transmitting, during said periods, a holding signal that occupies a band or bands of frequencies separate from that occupied by said command signal.

5,025,470

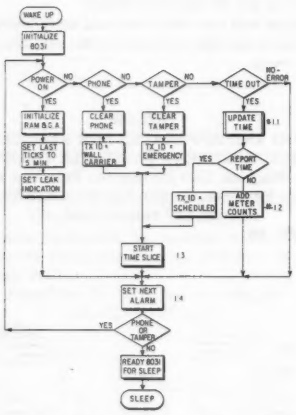
AUTOMATIC METER READING SYSTEM WITH MALFUNCTION PROTECTION

Raymond J. Thornborough, Menomonee Falls, and Donald H. Strobel, Cedarburg, both of Wis., assignors to Badger Meter, Inc., Milwaukee, Wis.

Division of Ser. No. 109,446, Jun. 19, 1987, Pat. No. 4,866,761, which is a continuation-in-part of Ser. No. 876,896, Jun. 20, 1986, Pat. No. 4,817,131. This application Sep. 8, 1989, Ser. No. 404,686

Int. Cl.[5] H04M *11/00*

U.S. Cl. 379—107 **11 Claims**



1. A malfunction protection system, comprising: malfunction detecting means having input terminals, and metering means having output terminals arranged to be coupled through connecting lead wire means to said input terminals of said malfunction detecting means for transmission of metering pulses to said malfunction detecting means, said metering means in developing metering pulses being arranged to shift between a first state in which a predetermined low impedance is presented between said output terminals thereof and a second state in which a predetermined higher impedance is presented between said output terminals of said metering means, and said malfunction detecting means including voltage supply means, impedance means coupling said voltage supply means to said input terminals of said malfunction detecting means, and voltage comparator means coupled to said input terminals of said malfunction detecting means to respond to changes in the impedance presented by said metering means and connecting lead wires, said comparator means being arragned to develop metering signals in response to shifts between voltages at said input terminals of said malfunction detecting means which correspond to said predetermined low impedance and high impedance states of said metering means, and said comparator means being arranged to develop a malfunction signal in response to a voltage at said input terminals of said malfunction detecting means which is substantially outside a range of voltages at said input terminals of said malfunction detecting means which correspond to said predetermined low impedance and higher impedance states of said metering means.

5,025,471

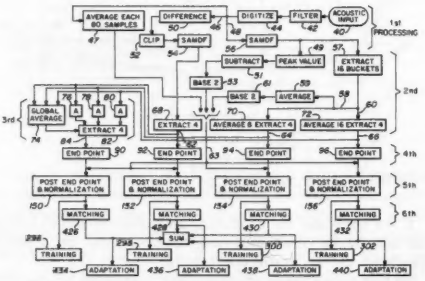
METHOD AND APPARATUS FOR EXTRACTING INFORMATION-BEARING PORTIONS OF A SIGNAL FOR RECOGNIZING VARYING INSTANCES OF SIMILAR PATTERNS

Brian L. Scott; Lloyd A. Smith; J. Mark Newell; Bruce E. Balentine, and Lisan S. Lin, all of Denton, Tex., assignors to Scott Instruments Corporation, Denton, Tex.

Filed Aug. 4, 1989, Ser. No. 389,682

Int. Cl.[5] G10L *5/00*

U.S. Cl. 381—43 **38 Claims**



1. A method for processing an acoustic input speech signal for extraction of individual utterances comprising the steps of:

(a) converting said speech signal into a first and second sequence of speech related samples;

(b) correlating the first sequence of speech related samples to derive a first histogram representing the input speech signal;

(c) correlating the second sequence of speech related samples to derive a second histogram representing the input speech signal;

(d) compressing the first and second histograms to derive a plurality of spaced channels;

(e) generating a compression histogram representing at least a part of the input speech signal from the spaced channels;

(f) repeating steps (a)–(e) to generate a sequence of compression histograms said sequence of compression histogram representing a transformation of the input speech signal;

(g) identifying end points for each utterance in the sequence of compression histograms; and

(h) extracting individual utterances from the sequence of compression histograms between the identified utterance end points.

5,025,472

REVERBERATION IMPARTING DEVICE

Yasushi Shimizu, and Fukushi Kawakami, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

Filed May 25, 1988, Ser. No. 198,473

Claims priority, application Japan, May 27, 1987, 62-130343

Int. Cl.[5] H03G *3/00*

U.S. Cl. 381—63 **11 Claims**

1. A reverberation imparting device comprising:

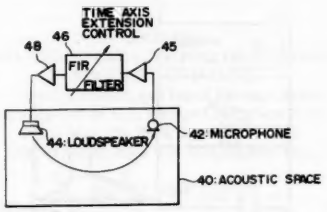
a microphone means disposed in an acoustic space for picking up sound in the acoustic space;

loudspeaker means disposed in the acoustic space for diffusing the sound picked up by said microphone means; and

feedback means comprising a signal processing circuit for electrically processing an electric signal corresponding to the sound picked up by said microphone means, an output of said signal processing circuit being supplied to said loudspeaker means,

said microphone means, feedback means and loudspeaker means forming a feedback loop, and

said signal processing circuit in said feedback means comprising means for subjecting a composite impulse response to a convolution operation to provide an output represen-



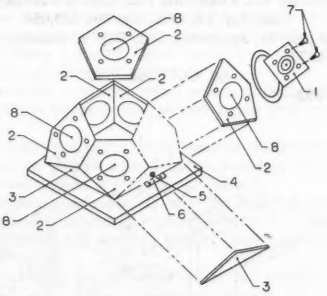
tative of the convolved impulse response to said loudspeaker means and means for increasing all delay times of impulse responses to increase reverberation time and decreasing all delay times of impulse responses to decrease reverberation time.

5,025,473

HEMISPHERICAL SPEAKER SYSTEM

George D. Carlsen, II, 1145, Sea Village Dr., Cardiff, Calif. 92007, and Ronald W. Vale, 416 W. San Ysidro Blvd., Suite L612, San Ysidro, Calif. 92073

Filed Aug. 24, 1989, Ser. No. 399,236
Int. Cl.[5] H04R *1/02, 25/00;* H05K *5/00*
U.S. Cl. 381—88 **4 Claims**



1. An arrangement of divergently mounted acoustic transducers comprising:

a substantially air tight frame with the general shape of a polyhedron having six sides plus a base, said polyhedron being formed by bisecting a dodecahedron twelve sided polyhedron at its equitorial plane, a base plate closing the bottom of said frame, said base plate having a top surface and a bottom surface;

the six sides of said frame each having substantially identical equal-sided pentagonal shaped plates, said pentagonal shaped plates having their sides beveled at an angle of 33 degrees;

five substantially identical triangularly shaped gussets, each gusset having a 108 degree angle and two base angles of 36 degrees each, the two equal length sides of said gussets being beveled at an angle of 33 degrees to mate with their corresponding equal-sided pentagonal shaped plates, the remaining side of said triangularly shaped gussets being beveled at an angle of 123 degrees to mate with the top surface of said base plate; and

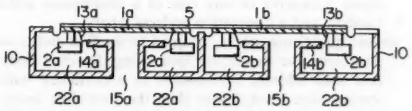
an acoustic transducer mounted in each of said pentagonal shaped plates, said acoustic transducers being substantially identical and being electrically connected to operate in phase.

5,025,474

SPEAKER SYSTEM WITH IMAGE PROJECTION SCREEN

Tsuneo Tanaka, Nishinomiya; Kazue Sato, Neyagawa; Hiroyuki Takewa, Kaizuka; Akira Kurozuka, Neyagawa; Tadashi Tamura, Kadoma; Katsuji Hattori, Takarazuka; Satoshi Takayama, Hirakata; Kosaku Murata, Kobe; Katsuaki Satoh, Osaka; Mituhiko Serikawa, Hirakata; Youichi Kimura, Ashiya, and Shuichi Obata, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 27, 1988, Ser. No. 249,954
Claims priority, application Japan, Sep. 29, 1987, 62-245101; Nov. 20, 1987, 62-294418; Dec. 1, 1987, 62-305016
The portion of the term of this patent subsequent to Feb. 6, 2007, has been disclaimed.
Int. Cl.[5] H04R *1/02*
U.S. Cl. 381—90 **18 Claims**



1. A speaker system comprising:

an acoustic diaphragm having a front surface and a rear surface, said front surface carrying an image projection screen thereon;

a driving unit provided on said rear surface of said diaphragm, for driving said diaphragm; and

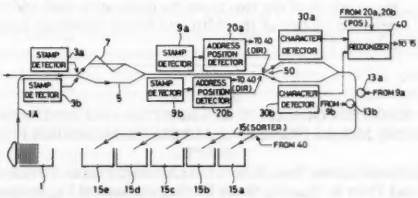
a cabinet provided on said rear surface of said diaphragm and defining an open space and a closed space therein so as to expose a part of said rear surface of said diaphragm to said open space and to enclose the other part of said rear surface of said diaphragm within said closed space.

5,025,475

PROCESSING MACHINE

Yoshie Okabe, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Feb. 24, 1988, Ser. No. 159,927
Claims priority, application Japan, Feb. 24, 1987, 62-39207
Int. Cl.[5] G06K *9/00*
U.S. Cl. 382—1 **6 Claims**



1. A mail processing machine, comprising:

(a) means for feeding a piece of mail having first and second surfaces;

(b) first detecting means for detecting the presence of a destination mail address on the first surface of the piece of mail, wherein the first detecting means comprises:

first light emitting means for emitting light onto the first surface of the piece of mail for coarse scanning; and

first photosensitive means, coupled to the first light emitting means, for detecting light emitted from the first

light emitting means and reflected from the piece of mail to obtain destination mail address information;

(c) second detecting means for detecting the presence of a destination mail address on the second surface of the piece of mail, wherein the second detecting means comprises:

second light emitting means for emitting light onto the second surface of the piece of mail for coarse scanning; and

second photosensitive means, coupled to the second light emitting means, for detecting light emitted from the second light emitting means and reflected from the piece of mail to obtain destination mail address information;

(d) means for determining a front side of the mail on which the destination mail address is detected to be present according to the presence of one of a destination mail address window, a destination mail address label, and a predetermined number of letters in the destination mail address, wherein the means for determining comprises:

first quantizing means, coupled to the first and second photosensitive means, for quantizing detected destination mail address information in accordance with a first slice level to generate a first destination address position signal indicative of any one of a destination address window and a destination address label;

second quantizing means, coupled to the first and second photosensitive means, for quantizing detected destination mail address information in accordance with a second slice level, lower than the first slice level, to generate a second destination address position signal indicative of destination address character;

third quantizing means coupled to the second detecting means;

first integrating means, coupled to the second quantizing means, for integrating the second destination mail address signal;

second integrating means, coupled to the third quantizing means, for integrating the signal output therefrom; and

comparing means, coupled to the second and third integrating means, for comparing the destination signal from the first integrating means with the signal from the second integrating means to determine mail front surface;

(e) third detecting means for detecting the destination mail address on the first surface of the piece of mail, when the first surface is determined as the front side of the mail;

(f) fourth detecting means for detecting the destination mail address on the second surface of the piece of mail, when the second surface is determined as the front side of the mail; and

(g) means for recognizing two types of an address including a handwritten address and a printed address and for deciding to which of the two types the destination mail address, detected by one of the third and fourth detecting means, belongs.

5,025,476

REDOTOPOGRAPHY APPARATUS AND METHOD USING MOIRé FRINGE ANALYSIS TO MEASURE FOOT SHAPES

Nathaniel Gould, Boca Raton, Fla.; Michael Fontes, Hinesburg, and Tyler R. Thessin, South Burlington, both of Vt., assignors to Nathaniel Gould Diagnostics, Inc., Wallingford, Conn.

Filed Oct. 31, 1988, Ser. No. 264,908

Int. Cl.[5] G06K 9/00

U.S. Cl. 382—2 **28 Claims**

1. A pedotopography apparatus comprising:

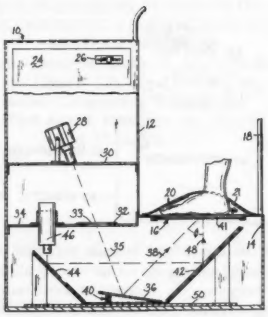
means for producing a moiré fringe pattern representative of the topography of the underside of a foot to be analyzed;

said fringe pattern being formed between the line grading and the line grating shadow on the underside of the foot;

image capture means for capturing and storing an image of the moiré fringe pattern in an image storage buffer;

image processing means for enhancing edges in the captured image;

image analyzing means operatively connected to the image capture means for analyzing the image of the moiré fringe



pattern to locate at least two points of interest on the foot; and

computing means for calculating information corresponding to the distance between the two points.

5,025,477

METHOD FOR OPTICALLY SENSING MARKS ON OBJECTS AND APPARATUS FOR CARRYING OUT THE METHOD

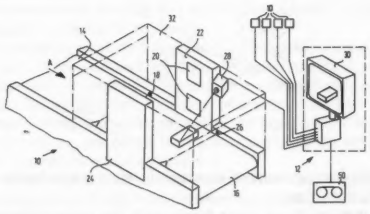
Guenter Baitz, Berlin, and Rudolf Behling, Moelin, both of Fed. Rep. of Germany, assignors to Siemens Nixdorf Informationssysteme AG, Paderborn, Fed. Rep. of Germany

Filed Apr. 14, 1989, Ser. No. 339,054

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1988, 3813725

Int. Cl.[5] G06K 9/00

U.S. Cl. 382—8 **13 Claims**



1. An apparatus for optically sensing markings on objects at a plurality of separate detection stations at each of which objects are transported by a transport apparatus through the sensing area of an optical sensing apparatus and whereby an object upon unsuccessful sensing of its markings is viewed by a camera means and a pictorial representation of the object produced by the camera means is transmitted to a central station, each of said detecting stations having a transport apparatus for moving the objects to be identified along a given path, means providing a tunnel at least partially covering a portion of said path, an optical sensing apparatus associated with said tunnel for identifying markings on the objects transported along said path by said transport apparatus, said transport apparatus being divided into at least first and second conveyor areas located successively along said path with each of said first and second areas having associated with it an individually controllable conveyor arrangement, said optical sensing apparatus being associated with said second conveyor area, two sensing arrangements located respectively in front of and following said sensing apparatus with respect to the general

direction of movement of objects along said path for registering the passage of an object into and out of association with said optical sensing apparatus, and at least one camera provided in said second conveyor area for forming a pictorial representation of an object located within said second conveyor area which pictorial representation may be transmitted to said central station and/or stored in a memory.

5,025,478

METHOD AND APPARATUS FOR DETECTING FALSE EDGES IN AN IMAGE

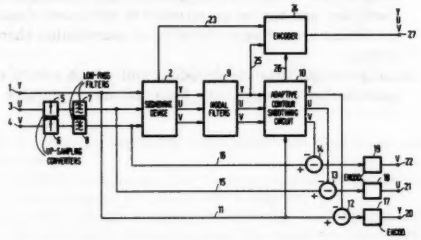
Octavius J. Morris, Redhill, and David Moran, Crawley, both of England, assignors to U.S. Philips Corp., New York, N.Y.

Filed Mar. 19, 1990, Ser. No. 496,375

Claims priority, application United Kingdom, Mar. 22, 1989, 8906587

Int. Cl.[5] G06K *9/46*

U.S. Cl. 382—22 **8 Claims**



1. A method of processing a picture signal for conveyance by means of a transmission path or storage medium, said method comprising the steps of:

i) producing a picture signal which corresponds to a picture,

ii) subjecting said picture signal to a segmentation algorithm to produce a region signal which identifies edges and closed regions in said picture,

iii) producing a texture signal which corresponds to the difference between said picture signal and said region signal,

characterised in that said method comprises the further steps of

iv) selecting, at least a portion of a boundary between two adjacent regions in said region signal,

v) determining the mean values of the region signal in areas immediately adjacent to and on either side of said boundary portion and forming the difference between these mean values,

vi) determining the mean values of the picture signal in corresponding areas immediately adjacent to and on either side of the boundary portion identified in said region signal and forming the difference between these means values,

vii) comparing the said difference obtained in step (v) with that obtained in step (vi), and

viii) using the result of the comparison performed in step vii) to determine whether the said boundary represents a true or false edge.

5,025,479

RECOGNITION METHOD FOR CHARACTER SET

Jose Pastor, 191 Wilton Rd., Westport, Conn. 06880

Filed Sep. 19, 1988, Ser. No. 245,610

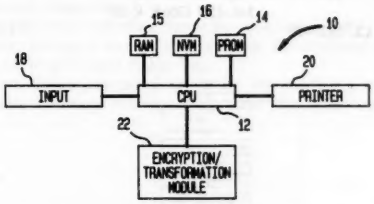
Int. Cl.[5] G06K *9/00*

U.S. Cl. 382—38 **13 Claims**

1. A method for recognizing characters selected from a character set having N characters having the form of connected graphs, the nodes of said graphs being positioned on a predetermined grid; comprising the steps of:

a) scanning one of said characters to determine features of said scanned character said features including the number of type 1 and type 3 points in said graph, wherein said type 1 points are nodes of said graph where one branch is connected and said type 3 points are nodes of said graph where three branches are connected;

b) making a first level classification of said scanned character based upon said determined numbers of type 1 and type 3 points; and



c) making a further classification of said scanned character based on the spatial relationships between said type 1 and type 3 points and recognition rules selected in accordance with said first level classification.

5,025,480

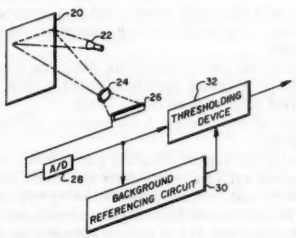
BACKGROUND REFERENCING

Roger A. Morton, Penfield, and Thomas J. Wetzel, Greece, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 23, 1987, Ser. No. 29,121

Int. Cl.[5] G06K *9/38*

U.S. Cl. 382—50 **14 Claims**



1. Background referencing apparatus for use with apparatus for scanning documents having images with object and background regions, wherein said background referencing apparatus (1) receives, from the scanning apparatus, a video signal having a value representing the document image, (2) generates a signal having a value representative of an estimate of a background density level of a document being scanned, and (3) further comprises:

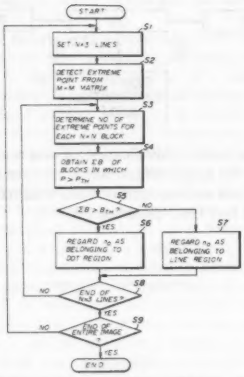
means for storing a generated estimated background level signal; and

means responsive to a generated estimated background level signal and a received video signal for producing an estimate-updating signal (1) when a received video signal changes in value in a direction associated with a transition from object to background, and (2) when a received video signal makes only a small change in value in a direction associated with transition from background to object, whereby large transitions from background to object result in substantially no change in a stored estimated background level signal.

5,025,481
DOT REGION DISCRIMINATING METHOD

Satoshi Ohuchi, Tokyo, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Oct. 4, 1989, Ser. No. 417,074
Claims priority, application Japan, Oct. 21, 1988, 63-263884; Oct. 24, 1988, 63-266212; Oct. 26, 1988, 63-268311; Oct. 26, 1988, 63-268312; Nov. 2, 1988, 63-275999
Int. Cl.[5] G06K 9/38
U.S. Cl. 382—53 70 Claims



1. A dot region discriminating method for discriminating a dot region of an image which is described by a digital multi-level input image signal, said dot region discriminating method comprising:

(a) an extreme point detecting step for detecting one or a plurality of extreme points from a first local region within the image, each of said extreme points corresponding to a peak or a valley of a density change of a picture element within said first local region, said first local region corresponding to a matrix which comprises M×M picture elements;

(b) a dot region detecting step for detecting whether or not

(1) one of a center picture element within one of said second local regions of the image or

(2) one of said second local regions, belongs to a dot region;

wherein the dot region detecting step is based on a distribution of the extreme points detected within said first local region by said extreme point detecting step, and wherein each of said second local regions corresponds to a block which comprises N×N picture elements; and

(c) a discriminating step for discriminating the dot region of the image based on the detection made by said dot region detecting step.

5,025,482
IMAGE TRANSFORMATION CODING DEVICE WITH ADAPTIVE QUANTIZATION CHARACTERISTIC SELECTION

Tokumichi Murakami; Kohtaro Asai, and Kazuhiro Matsuzaki, all of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 21, 1990, Ser. No. 525,588
Claims priority, application Japan, May 24, 1989, 1-128867
Int. Cl.[5] G06K 9/36
U.S. Cl. 382—56 4 Claims

1. A transformation coding device comprising:

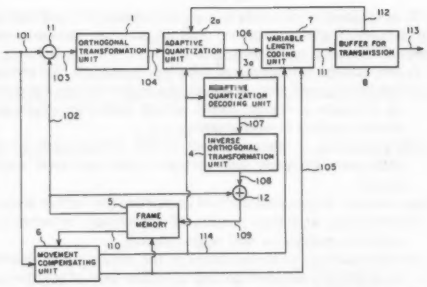
a movement compensating unit which divides a digital image input signal series into a plurality of blocks, and thereafter compares respective blocks with corresponding preceding frame image signals located at the same spatial positions or in the vicinity of said position, detects the most similar portions of said blocks from among said preceding frame image signals, and outputs a spatial amount of displacement between said blocks and the similar portions of said preceding frame image signals as a motion vector;

a subtractor which subtracts a prediction signal between movement compensating frames produced in accordance with said motion vector from said digital image input signal and a generates difference signal corresponding to the result of said subtraction;

an orthogonal transformation unit which applies orthogonal transformation to said difference signal and outputs a transformation coefficient;

an adaptive quantization unit which selects one quantization characteristic from among a plurality of predetermined quantization characteristics in accordance with both the degree of similarity of the prediction signal between movement compensating frames for said block digital image signal series and a sequence of said transformation coefficient and applies quantization to said transformation coefficient according to the selected quantization characteristic;

an adaptive quantization decoding unit which selects one quantization characteristic from among a plurality of



predetermined quantization characteristics corresponding to both the degree of similarity of the prediction signal between movement compensating frames and the sequence of said transformation coefficient, and applies quantization decoding to the quantized transformation coefficient from said adaptive quantization unit;

an inverse orthogonal transformation unit which applies inverse orthogonal transformation to the quantization decoded transformation coefficient to produce a difference signal between decoded frames;

an adder which adds said difference signal between decoded frames and said prediction signal between movement compensating frames to produce a decoded image signal;

a frame memory which stores said decoded image signal temporarily to output said prediction signal between movement compensating frames in accordance with said motion vector;

a variable length coding unit which applies variable length coding to said quantized transformation coefficient and outputs the result as coded data; and

a transmitting buffer which stores said coded data temporarily, outputs them with a fixed bit rate, and at the same time, outputs an amount of buffer data storage as a feedback signal to said adaptive quantization unit in order to prevent buffer overflow.

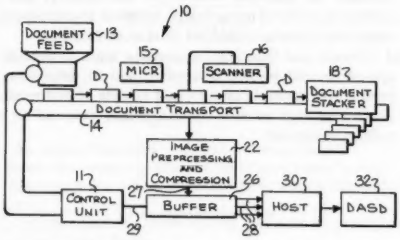
5,025,483
SYSTEM FOR SCANNING DOCUMENTS WITHOUT LOSS OF IMAGE DATA

Raymond F. Dinan, Mint Hill; Hugh C. Fallon; Jerald R. Malin, both of Charlotte; Robert R. Rodite, Matthews; Clair F. Rohe, Charlotte, and Gene D. Rohrer, Concord, all of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 134,493, Dec. 18, 1987, abandoned. This application Jan. 25, 1990, Ser. No. 469,967

Int. Cl.[5] G06K *9/20*

U.S. Cl. 382—58 **10 Claims**



1. A system for capturing video image data from documents comprising

document feed means for feeding successive documents from a hopper to a document transport,

document transport means for receiving each successively fed document and advancing the respective documents past a document scanner,

document scanner means for scanning the successively transported documents and for generating therefrom video image data, the quantity of which may vary widely depending upon the amount of information present on the document,

a buffer for receiving and temporarily storing video image data,

data input means for directing video image data obtained from said document scanner means into said buffer,

data output means cooperating with said buffer for extracting video image data from the buffer, and

control means cooperating with said buffer and operable to perform a hierarchy of control actions over the flow of video image data into said buffer to assure data integrity and prevent loss of data, said control means including

a first control action means operable in response to the level of stored data in said buffer reaching a first threshold for effecting stopping of the feed of additional documents by said document feed means while allowing documents already in the document transport to continue in process, and

a second control action means for sensing the rate at which said buffer is filling with data, and in response to said rate exceeding a predetermined limit, said second control action means being operable for effecting stopping of the feed of additional documents by said document feed means even though said first threshold may not have been met.

5,025,484
CHARACTER READER DEVICE

Masaya Yamanari, and Masami Ikeda, both of Ohme, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 15, 1988, Ser. No. 232,189

Claims priority, application Japan, Dec. 11, 1987, 62-314349

Int. Cl.[5] G06K *9/00*

U.S. Cl. 382—61 **6 Claims**

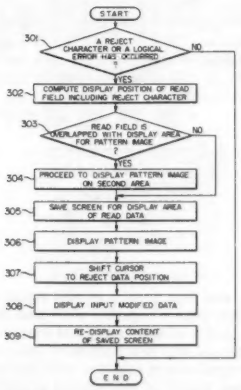
1. A character reading apparatus for processing an input data sheet including character data, the character reading apparatus for use with a computer system including a display apparatus having a plurality of display areas including at least first and second display areas, the character reading apparatus comprising:

scanner means for scanning the input data sheet and for producing an output image data corresponding to the input data sheet;

character recognizing means for recognizing a character having a clarity of at least a predetermined level in the output image data;

reject character detecting means for detecting a reject character having a level of clarity below the predetermined level in the output image data;

pattern image generating means for reproducing a reject character image corresponding to the reject character;



position computing means for computer a display position on the display apparatus in accordance with the recognized character and the reject character;

display control means for displaying an image of each of the recognized character and the reject character in accordance with the display position from the position computer means, and for selectively displaying the reject character image in the first display area or the second display area;

decision means for determining whether the displayed reject character overlaps the first display area; and

shifting means for shifting the displayed reject character image to the second display area when the decision means determines that the displayed reject character overlaps the first display area.

5,025,485
MULTI-FEED, MULTI-CHANNEL COMMUNICATION SYSTEM

Rezso J. Csongor, King of Prussia, Pa., and Leroy J. Tangradi, Bellmawr, N.J., assignors to General Electric Company, East Windsor, N.J.

Filed Jan. 12, 1989, Ser. No. 296,456

Int. Cl.[5] H04B *7/19*

U.S. Cl. 455—12 **12 Claims**

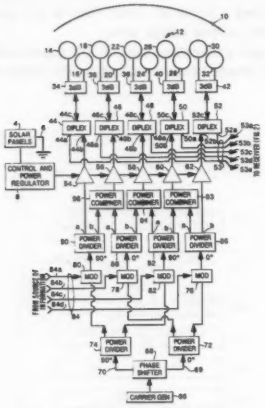
1. A multifeed, multichannel communications system, comprising:

first, second and third signal sources, each generating a signal at the same carrier frequency, and each being adapted to be modulated with independent information, said first and third sources being at the same reference phase of said carrier, and said second signal source being in phase quadrature with said reference phase;

first, second, third and fourth radiating means, said first and second radiating means being physically contiguous, said second and third radiating means being physically contig-

uous, and said third and fourth radiating means being physically contiguous; and

coupling means coupled to said first, second and third signal sources and to said first, second, third and fourth radiating means, for dividing the signal power of each of said first, second and third signal sources into first and second equal portions, and for coupling said second portion of said signal power of said first signal source to said first radiating means, said first portion of said signal power of said second signal source together with said first portion of said signal power of said first signal source to said second radiating means, said first portion of said signal power of said third signal source together with said second portion of said signal power of said second signal source to said third radiating means, and said second portion of said signal power of said third signal source to said fourth radiating means.

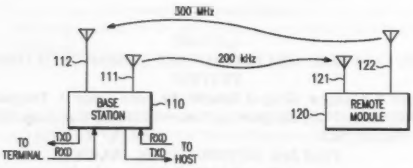


5,025,486

WIRELESS COMMUNICATION SYSTEM WITH PARALLEL POLLING

Kevin M. Klughart, Addison, Tex., assignor to Dallas Semiconductor Corporation, Dallas, Tex.

Filed Dec. 9, 1988, Ser. No. 282,406
Int. Cl.[5] H04J *3/16*
U.S. Cl. 455—54 **20 Claims**



1. A wireless communication system, comprising:

at least one base station, and a set of remote modules;

wherein said base station includes a first RF transmitter capable of operation at a first frequency, and a second RF receiver capable of operation at a second frequency;

and wherein each of said remote modules includes a first RF receiver capable of operation at said first frequency, and a second RF transmitter capable of operation at said second frequency;

and said first transmitter and said second receiver of said base station, and said second transmitter and said first receiver of said remote module, are connected so that said base station and said remote module can carry on data communications on said first and second frequencies, but only while in mutual proximity;

wherein said base station can broadcast a polling command, over said first frequency, to ascertain what remote modules are in proximity at a given moment;

whereupon, if a respective one of said modules happens to be in proximity to said base station and respective module will receive said poling command through said respective first receiver, and will respond to said polling command, throuyh said respective second transmitter thereof, with a response which includes an identification field;

and wherein at least a portion of said identification field contains bit positions which are individually, and not combinatorially or numerically, assigned to correspond to respective subsets of said set of remote modules;

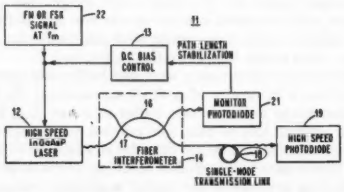
and wherein said base station contains logic to decode response to said polling command, and to determine the presence of multiple ones of said subsets of said modules, if ones of said subsets simultaneously respond to said polling command.

5,025,487

SYSTEM FOR TRANSMITTING INFORMATION ON INTERFEROMETRICALLY GENERATED OPTICAL CARRIERS

Elliot G. Eichen, Arlington, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Continuation-in-part of Ser. No. 4,504, Jan. 20, 1987, Pat. No. 4,749,277. This application Jun. 7, 1988, Ser. No. 203,661
Int. Cl.[5] H04B *10/04*
U.S. Cl. 455—618 **5 Claims**



1. An optical transmitter, comprising:

means for generating a sinusoidal drive signal;

means for modulating said drive signal with an information signal;

a semiconductor laser;

means for applying said modulated drive signal and a DC bias signal to said laser for modulating said laser, wherein the modulated output spectrum from said laser has both frequency modulated components and amplitude modulated components;

interferometric means for splitting said laser output signal into two separate light beams which subsequently travel over respective path lengths having an optical path difference therebetween before being combined into an output signal; and

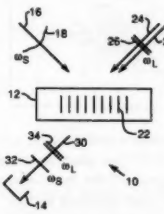
means for adjusting said optical path difference to a selected value such that the output signal from said interferometric means is due solely to frequency modulated components at either even harmonics or odd harmonics of said modulated drive signal in accordance with said selected path difference, said harmonics being at frequencies which are much greater than the bandwidth of said laser.

5,025,488

OPTICAL HETERODYNE DETECTOR

Pochi A. Yeh, Thousand Oaks, and John H. Hong, Moorpark, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 16, 1989, Ser. No. 437,968
Int. Cl.[5] G02F 1/00
U.S. Cl. 455—619 10 Claims



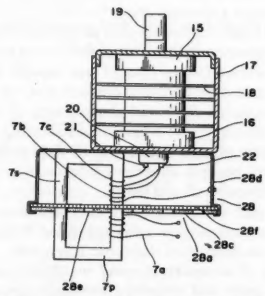
1. An optical heterodyne detector comprising:
a received optical signal beam, said signal beam having a first frequency and a first wave front carrying spatial information;
an optical reference beam having said first frequency and a second wave front;
a local oscillator beam alternated in time with said reference beam, said local oscillator beam having a second frequency and said second wave front;
a nonlinear optical medium for receiving and mixing said signal beam and said reference beam to produce a hologram in said nonlinear medium, said hologram containing said spatial information of said received optical signal beam;
an output beam comprising diffracted and undiffracted components of said signal beam and said local oscillator beam passing through said hologram; and
a photodetector for detecting an optical heterodyne signal produced by said components of said output beam.

5,025,489

TRANSFORMER HAVING SHIELDING WALL FOR DRIVING A MAGNETRON

Kimiaki Yamaguchi, Nara, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 194,281, May 16, 1988, abandoned. This application Jun. 19, 1990, Ser. No. 540,870
Claims priority, application Japan, May 14, 1987, 62-117337; May 14, 1987, 62-117342
Int. Cl.[5] H05B 6/76; H01F 15/04
U.S. Cl. 219—10.55 B 16 Claims



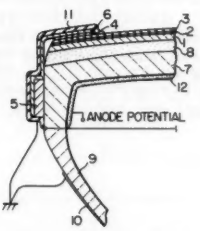
1. A transformer comprising a primary coil winding, a secondary coil winding, and a wave shielding wall provided between the primary coil winding and secondary coil winding and having an external shape constructed by plates of metal, the plates being provided with numerous through holes each disposed vertically relative to a plane of one of the plates and having a cross-section defining a polygon, each through hole being arranged at a position adjacent to at least one other in an arrangement of a common wall plate being formed at a front and rear sides as wall planes, the thickness of the plates constructing the wall planes of each of the through holes being provided in a dimension of less than about one tenth a depth of penetration of an electromagnetic wave with respect to an employed frequency of the transformer to be determined in relationship with the material of the plates.

5,025,490

CATHODE-RAY TUBE WITH ITS DISPLAY FRONT PROTECTED FROM UNDESIRABLE ELECTRIFICATION

Katsuyoshi Tamura, Mobara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 29, 1989, Ser. No. 400,000
Claims priority, application Japan, Sep. 19, 1988, 63-232301
Int. Cl.[5] H01J 29/87; H04N 5/65
U.S. Cl. 313—479 23 Claims



1. A cathode-ray tube including an anode to be supplied with a high voltage in operation, comprising:
a glass bulb having a panel portion;
a transparent, electrical conductive film fixed with respect to an outer surface of said panel portion;
a transparent, electrical insulating layer provided on said conductive film; and
an electrode unit provided on said insulating layer and electrical connected with a common potential line, said high voltage being established with respect to said common potential, said electrode unit, said electrical insulating layer and said electrical conductive film forming a capacitor.

5,025,491

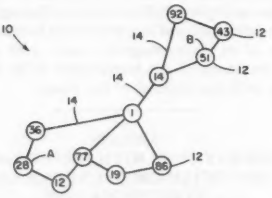
DYNAMIC ADDRESS BINDING IN COMMUNICATION NETWORKS

Paul F. Tsuchiya, Washington, D.C., and Robert H. Stine, Arlington, Va., assignors to The Mitre Corporation, Bedford, Mass.

Continuation of Ser. No. 210,226, Jun. 23, 1988, abandoned. This application Oct. 26, 1989, Ser. No. 427,976
Int. Cl.[5] H04B 1/00
U.S. Cl. 340—825.52 45 Claims

1. A communication network comprising
a plurality of destination stations and associated server stations,
each destination station having a unique destination address,
each server station having a unique server address,
each destination station having a unique destination name containing no predetermined indication of the address of an associated server station and no predetermined indication of a name of an associated server station,
each server station comprising means for storing the destination address of each destination station in which it is associated,

the server address being found by an algorithmic manipulation of the destination name of any destination station that is associated with the server station, the algorithmic manipulation producing an output that changes in accordance with changes in a routing table containing addresses of operational server stations, so that the server address found by the algorithmic manipulation is always a server address listed on the routing table.



5,025,492

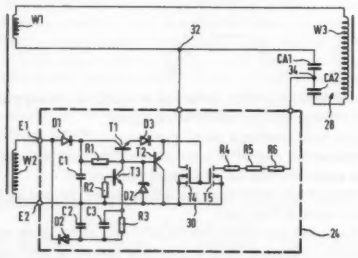
DAMPING CIRCUIT FOR THE ANTENNA RESONANCE CIRCUIT OF A RADIO TRANSMITTER-RECEIVER

Bruno Viereck, Marzling, Fed. Rep. of Germany, assignor to Texas Instruments Deutschland GmbH, Dallas, Tex.

Filed Apr. 11, 1990, Ser. No. 507,683

Int. Cl.[5] G01S *13/74*; G08B *13/184*

U.S. Cl. 342—144 **4 Claims**



1. Damping circuit for the antenna resonance circuit of a radio transmitter-receiver which in a transmitting phase transmits a time-limited energy-rich HF interrogation pulse and in a receiving phase following the transmitting phase is ready to receive high-frequency response signals coming from a responder which transmits said response signals as a reaction to the reception of the interrogation pulse, including a damping member adapted to be connected to the antenna resonance circuit and separated therefrom, a switching means which on reception of a switching voltage connects the damping member to the antenna resonance circuit, a first energy-storage element chargeable by the HF interrogation pulse for furnishing the switching voltage and a second energy-storage element which is chargeable by the HF interrogation pulse and which in dependence upon the time profile of the HF interrogation pulse enables the application of the switching voltage present at the first energy-storage element to the switching means.

5,025,493

MULTI-ELEMENT ANTENNA SYSTEM AND ARRAY SIGNAL PROCESSING METHOD

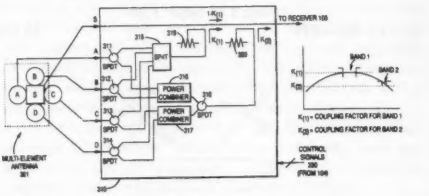
James Cook, Jr., Tucker, Ga., assignor to Scientific-Atlanta, Inc., Atlanta, Ga.

Filed Jun. 2, 1989, Ser. No. 360,823

Int. Cl.[5] H01Q *3/02, 3/12*

U.S. Cl. 342—374 **50 Claims**

1. Antenna array processor apparatus for automatically tracking a target comprising multiple antenna elements of a multi-element antenna feed, the elements having parallel-planar apertures, a signal switching means coupled to the multiple antenna elements for selecting from a plurality of signals of the multiple antenna elements and a signal coupler for coupling a selected signal of one of the plurality of antenna element signals with another signal of the multi-element antenna feed to produce an antenna beam steering signal.



5,025,494

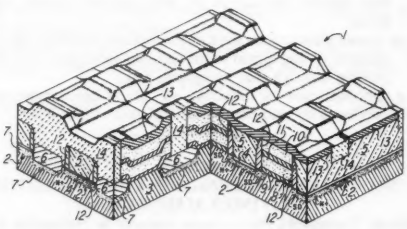
CROSS-POINT CONTACT-FREE FLOATING-GATE MEMORY ARRAY WITH SILICIDED BURIED BITLINES

Manzur Gill, Rosharon, and David J. McElroy, Rosenberg, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 10, 1988, Ser. No. 269,838

Int. Cl.[5] H01L *29/68, 23/48, 27/10*

U.S. Cl. 357—23.5 **22 Claims**



1. A non-volatile memory cell array, comprising:

a plurality of parallel conductors including source-drain regions formed in a face of a semiconductor substrate, each of said conductors being a heavily-doped region of second conductivity-type opposite that of a first conductivity type of the underlying material of said semiconductor substrate, each of said source-drain regions being spaced from at least one other said source-drain region on said face by a channel area;

thick field oxide regions located at the face of said semiconductor substrate between adjacent ones of said conductors and between adjacent ones of said channel areas;

a floating gate over each said channel area, the floating gate being separated from said channel area of said face by a gate insulator layer, wherein said floating gate extends over a part of each adjacent thick field oxide region, the extensions being in directions substantially at right angles to the direction of said parallel conductors;

a control gate extending along said face over said floating gate, the control gate being separated from said floating gate by an inter-level dielectric layer; and

a plurality of separately formed wordlines contacting said control gates and extending over said control gates in a direction substantially at right angle to the direction of said parallel conductors;

wherein each of said conductors including said source-drain regions also includes a silicided region.

5,025,495

MOTION DEPENDENT VIDEO SIGNAL PROCESSING

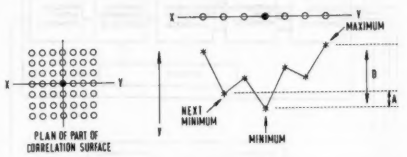
Richard J. A. Avis, Basingstoke, United Kingdom, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 20, 1990, Ser. No. 512,813

Claims priority, application United Kingdom, Apr. 27, 1989, 8909648

Int. Cl.[5] H04N *7/01*

U.S. Cl. 358—140 10 Claims



1. A motion compensated video standards converter for converting a video signal conforming with a first video standard to a converted video signal conforming with a second video standard, said video signal being provided as a sequence of intervals selected from fields and frames, each of said intervals being arranged in a plurality of blocks each representing a portion of an image represented by said video signal, comprising:

comparing means for comparing each of a plurality of blocks in a first interval of said video signal with a plurality of blocks in an adjacent interval of said video signal by generating a respective correlation surface representing respective differences between the image portion represented by said each of said plurality of blocks in said first interval and the respective image portions represented by each of said plurality of blocks in said adjacent interval;

motion vector deriving means for deriving a motion vector representing motion of said image portion represented by said each of said plurality of blocks in said first interval based upon a detection of a clear minimum value of said respective correlation surface by determining whether a minimum of said respective differences represented by said respective correlation surface differs from a next smallest difference selected from at least some of said respective differences represented by said respective correlation surface by more than a predetermined amount; and

interpolator means for producing said converted video signal, said interpolator means being controlled at least in dependence on said motion vector derived by said motion vector deriving means.

5,025,496

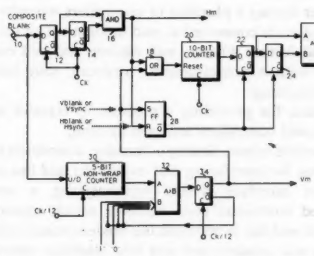
ODD/EVEN FIELD DETECTOR FOR VIDEO SIGNALS

Barth A. Canfield, Indianapolis, Ind., assignor to RCA Licensing Corporation, Princeton, N.J.

Filed May 7, 1990, Ser. No. 520,205

Int. Cl.[5] H04N *5/04*

U.S. Cl. 358—153 7 Claims



1. In a video signal processing system for processing video signal having first and second alternating field types, said first and second field types including horizontal and vertical signal components and differing with respect to a timing relationship of their respective horizontal and vertical signal components, apparatus for generating a field type indicating signal comprising:

means for providing a vertical signal corresponding to said vertical component;

means for providing a horizontal signal corresponding to said horizontal component;

means responsive to said vertical and horizontal signals for measuring an interval between a transition of said vertical signal and a predetermined transition of said horizontal signal, and providing a measurement value for each field; and

means for comparing the measurement value from a field with the measurement value of the immediately preceding field of video signal to provide a field type indicating signal.

5,025,497

FACSIMILE APPARATUS CONNECTED TO DATA COMMUNICATION NETWORK HAVING TIME-SAVING CAPABILITY

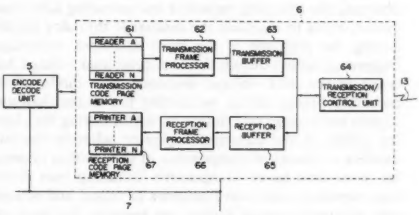
Yoshio Yoshiura, Ninomiya, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 940,497, Dec. 10, 1986, abandoned. This application Mar. 22, 1989, Ser. No. 326,447

Claims priority, application Japan, Dec. 17, 1985, 60-283992

Int. Cl.[5] H04N *1/32*

U.S. Cl. 358—425 15 Claims



1. A facsimile apparatus connected to a line of a packet switch network comprising:

a plurality of generating means each for generating image data representing an original image;

memory means for storing the image data from said plurality of generating means;

transmitting means for converting said image data stored in said memory means into a plurality of packet data and for transmitting said packet data to said line; and

control means for controlling said transmitting means such that a plurality of packet data of a first original image and a plurality of packet data of a second original image are transmitted to said line time-divisionally.

5,025,498

APPARATUS FOR CONTROLLING THE TRIGGER SEQUENCE IN IGNITION SYSTEMS

Nils A. Agren, Åmål, Sweden, assignor to SEM AB, Åmål, Sweden

Continuation of Ser. No. 25,402, Mar. 13, 1987, abandoned. This application Jul. 27, 1989, Ser. No. 388,299

Claims priority, application Sweden, Mar. 14, 1986, 8601219

Int. Cl.[5] H01H *47/00*

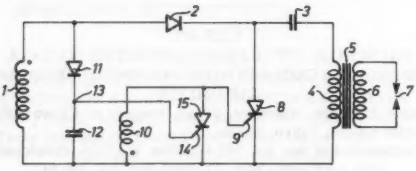
U.S. Cl. 361—156 1 Claim

1. In a high reliability ignition system utilizing a minimum number of electrical components for controlling the triggering

sequence in response to a rotating permanent magnet for internal combustion engines having a spark coil, and a core of magnetic conducting material carrying a capacitor charging coil, and an electrically separate triggering coil wired in reverse polarity to said charging coil and cooperating with the rotating permanent magnet for producing three generated halfwaves in sequence in said coils, the charging coil being connected in series with a rectifier, a charging capacitor, and the primary winding of said spark coil, and a discharge thyristor connected in series with the charging coil and the primary winding of the spark coil and having its input gate coupled across the triggering coil, the improvement comprising

an actuating timing circuit having a series combination of a diode and timing capacitor connected across the charging coil;

a switching thyristor having its anode connected to one terminal of the triggering coil and having its input gate connected to the intersection of said diode and said timing



capacitor, the cathodes of said switching and discharge thyristor being connected together to the opposite terminal of the triggering coil, so that the charging capacitor discharges its stored charge upon the conduction of the discharge thyristor, the second halfwave being used for charging the charging capacitor and actuating said timing circuit, so as to maintain the discharge thyristor inactive during the presence of the third halfwave, whereupon triggering occurs during the first generated voltage halfwave in the next voltage sequence, said diode of said actuating timing circuit, permitting the second halfwave to pass and charge said timing capacitor during the charging phase of the charging capacitor wherein the total number of electrical components of the ignition system is no more than seven components including two diodes, two capacitors and two thyristors or triacs, and wherein said electrical circuit utilizes no resistors for high efficiency.

5,025,499

PROCESS CONTROL METHOD AND CONTROL SYSTEM

Haruki Inoue, Katsuta; Motohisa Funabashi, Sagamihara; Masakazu Yahiro, Hitachi, and Fumiki Tanaka, Ebetsu, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Engineering Co., Ltd., Ibaraki, both of Japan

Filed Apr. 12, 1989, Ser. No. 336,797

Claims priority, application Japan, Apr. 13, 1988, 63-89077

Int. Cl.[5] G05B *13/02*

U.S. Cl. 364—165 **7 Claims**

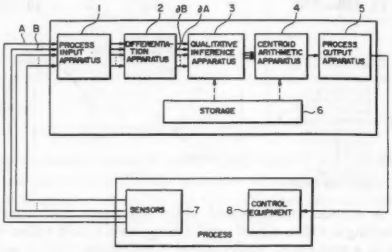
1. A process control system for controlling a process, comprising:

differentiation means for receiving different kinds of process information from process sensors which measure different variables of a process and calculating amounts of change of said process information with respect to time;

qualitative evaluation means, connected to said differentiation means, for evaluating in evaluation stages said process information or said amounts of change of said process information with respect to time by a membership function previously determined as having fuzzy amounts;

qualitative inference means, connected to said qualitative evaluation means, for inferring a qualitative evaluation value set of control target process information after a unit of time by experiential rules on the basis of combinations of values in each of said evaluation stages;

centroid arithmetic means, connected to said qualitative inference means, for receiving said qualitative evaluation value set inferred by said qualitative inference means and determining an amount of control of said control target



process information by centroid arithmetic processing of said membership function; and

output means, connected to said centroid arithmetic means, for supplying said amount of control determined by said centroid arithmetic means to said process, thereby causing a change in operation of said process according to said amount of control.

5,025,500

APPARATUS FOR PROVIDING MULTIPLE CONTROLLER INTERFACES TO A STANDARD DIGITAL MODEM AND INCLUDING INTEGRAL CONFLICT RESOLUTION

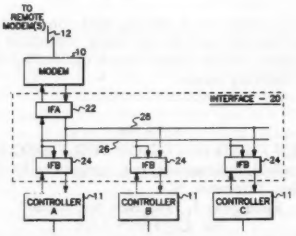
Thomas L. Phinney, Boulder City, Nev., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 9, 1989, Ser. No. 363,843

The portion of the term of this patent subsequent to Feb. 12, 2008, has been disclaimed.

Int. Cl.[5] H04J *03/04*; H04B *01/38*

U.S. Cl. 370—85.13 **29 Claims**



1. In a combination system, having a modem for providing an interface to a communication link, said communication system further having a plurality of controllers whereby each of said controllers is connected to said modem via an interface apparatus, and further wherein said modem and said controllers comply with a predetermined protocol, said interface apparatus comprising:

a) bus means, for providing a medium to transfer signals between said controllers and said modem;

b) first interface means, having a decoder, connected to said bus means, for interfacing said modem to said bus means, said first interface means implementing a modem-associated multi-state state machine which responds to signals on said bus to maintain the predetermined protocol between said modem and said first interface means, the predetermined protocol being maintained by decoding

signals from said bus means based on a current state of the multi-state state machine; and

c) a plurality of second interface means, each having an encoder, each of said second interface means being connected to said bus means and to a corresponding controllers, for interfacing each of said plurality of controllers to said bus means, each of said second interface means implementing a controller-associated multi-state state machine which responds to signals on said bus means and further responds to signals from the corresponding controller, each of said second interface means maintaining the predetermined protocol between the second interface means and the corresponding controller, and wherein each of said second interface means transmits onto said bus means in a predetermined cycle to resolve conflicts between controllers for access to said bus means.

317,522

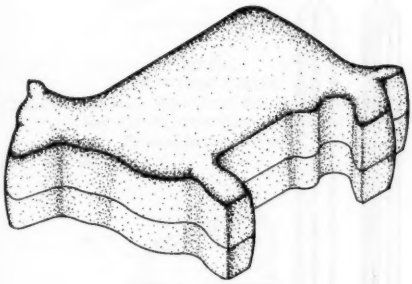
HAMBURGER BUN OR SIMILAR ARTICLE

Robert H. Hicks, Sr., and Linda M. Hicks, both of 5114 Northridge, Houston, Tex. 77033

Filed May 19, 1988, Ser. No. 196,108

Term of patent 14 years

U.S. Cl. D1—107



317,523

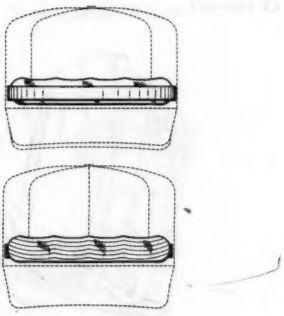
REMOVABLE SWEAT BAND FOR HATS

LeRoy E. Smith, 4832-E SW. 152nd Ct., Miami, Fla. 33185-4226

Filed May 18, 1988, Ser. No. 195,181

Term of patent 14 years

U.S. Cl. D2—261



317,524

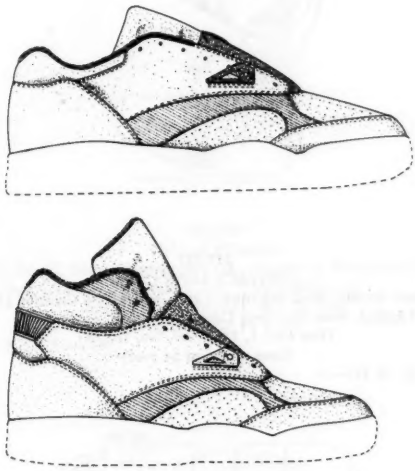
SHOE UPPER

John Earle, Tigard, Oreg., assignor to Avia Group International, Inc., Portland, Oreg.

Filed Jun. 25, 1990, Ser. No. 543,194

Term of patent 14 years

U.S. Cl. D2—314



317,525

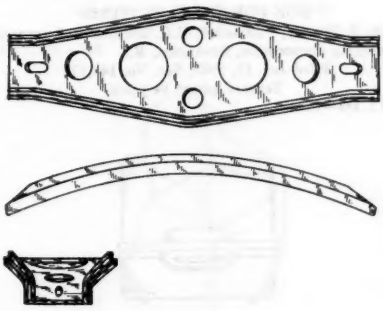
BAND FOR HEADSET

Christopher D. Wiegel, Minneapolis, Minn., assignor to Telex Communications, Inc., Minneapolis, Minn.

Filed Nov. 24, 1986, Ser. No. 934,128

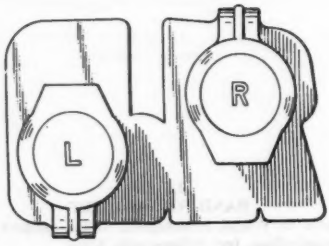
Term of patent 14 years

U.S. Cl. D2—512



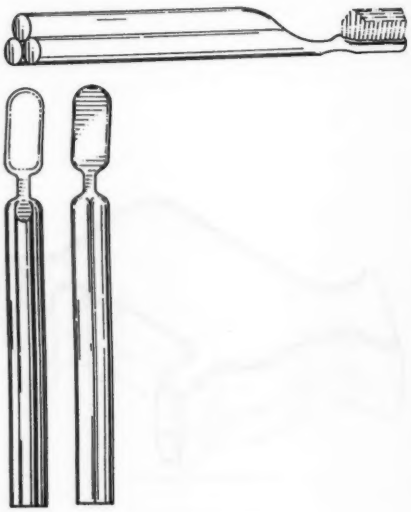
317,526
EYEGLASS CARRYING CASE
Ralph R. Lapham, New London, N.H., assignor to Uvex Winter Optical, Inc., North Smithfield, R.I.
Filed Feb. 20, 1987, Ser. No. 27,260
Term of patent 14 years
U.S. Cl. D3—34

317,527
CONTACT LENS CASE
Carol Bonelli, West Hartford, Conn., assignor to Creative Link Limited, West Hartford, Conn.
Filed Oct. 1, 1987, Ser. No. 103,587
Term of patent 14 years
U.S. Cl. D3—34

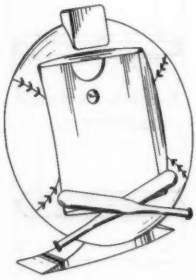


317,528
BOX FOR JEWELRY ITEMS
Thomas J. Harvey, Pawtucket, R.I., assignor to International Packaging Corporation, Pawtucket, R.I.
Filed Jan. 11, 1988, Ser. No. 143,172
Term of patent 14 years
U.S. Cl. D3—75

317,529
TOOTHBRUSH HANDLE
Lucia Smigel, and Irwin E. Smigel, both of 150 E. 69th St., New York, N.Y. 10021
Filed Nov. 10, 1988, Ser. No. 269,656
Term of patent 14 years
U.S. Cl. D4—104



317,530
BASEBALL MOTIF PICTURE FRAME
Susan M. Masterson, 8707 W. 102nd St., Apt. #3, Overland Park, Kans. 66212
Filed Apr. 18, 1989, Ser. No. 340,162
Term of patent 14 years
U.S. Cl. D6—303



317,531
VANITY MIRROR
Keith Evans, Montpelier, Ohio, assignor to Design Institute America, Inc., Jasper, Ind.
Filed Feb. 28, 1989, Ser. No. 316,688
Term of patent 14 years
U.S. Cl. D6—309

317,532
HUNTING CHAIR
R. Chapman Meadows, 304 Cahaba Rd., Selma, Ala. 36701
Filed Apr. 27, 1988, Ser. No. 187,062
Term of patent 14 years
U.S. Cl. D6—355

317,533
VEHICLE SEAT OR SIMILAR ARTICLE
Frank Beermann, Kirchheim, Fed. Rep. of Germany, assignor to Keiper Recaro GmbH & Co., Fed. Rep. of Germany
Filed Mar. 2, 1988, Ser. No. 163,404
Claims priority, application Fed. Rep. of Germany, Sep. 8, 1987, 2MR922
Term of patent 14 years
U.S. Cl. D6—356

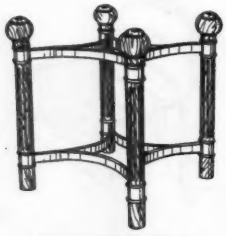
317,534
VEHICLE SEAT OR SIMILAR ARTICLE
Dietger Hänsel, Umkirch, Fed. Rep. of Germany, assignor to Keiper Recaro GmbH & Co., Fed. Rep. of Germany
Filed Nov. 12, 1987, Ser. No. 119,421
Claims priority, application Fed. Rep. of Germany, May 27, 1987, 2MR917
Term of patent 14 years
U.S. Cl. D6—356

317,535
CHAIR FRAME
Stephen C. Hess, Birmingham, Ala., assignor to Winston Furniture Company of Alabama, Inc., Birmingham, Ala.
Filed Jun. 1, 1988, Ser. No. 201,103
Term of patent 14 years
U.S. Cl. D6—380

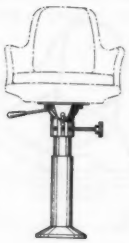
317,536
CHAIR FRAME
Stephen C. Hess, Birmingham, Ala., assignor to Winston Furniture Company of Alabama, Inc., Birmingham, Ala.
Filed Jun. 1, 1988, Ser. No. 201,102
Term of patent 14 years
U.S. Cl. D6—380

317,537
TABLE
Giovanni Pino, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed May 16, 1988, Ser. No. 194,117
Term of patent 14 years
U.S. Cl. D6—484

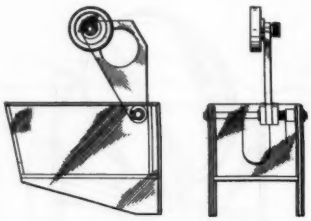
317,538
TABLE BASE
Robert L. Wilson, Memphis, Tenn., assignor to Chromcraft Furniture Corp., Senatobia, Miss.
Filed May 29, 1990, Ser. No. 529,526
Term of patent 14 years
U.S. Cl. D6—495



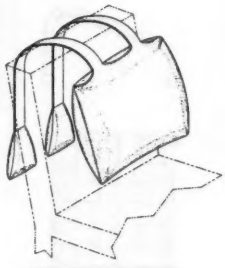
317,539
ADJUSTABLE BOATING CHAIR PEDESTAL
Howard G. Goldsmith, Cranston, R.I., assignor to Todd Enterprises, Inc., Cranston, R.I.
Filed Dec. 23, 1986, Ser. No. 947,765
Term of patent 14 years
U.S. Cl. D6—495



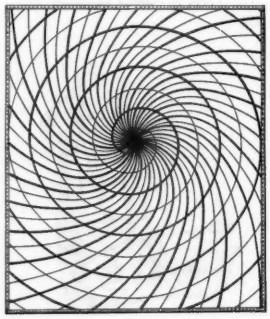
317,540
PERMANENT WAVE TISSUE DISPENSER
Marvin T. Reid, 3913 Douglas, and August J. Wesell, 3914 Douglas, both of Garland, Tex. 75041
Filed Jun. 10, 1988, Ser. No. 204,789
Term of patent 14 years
U.S. Cl. D6—518



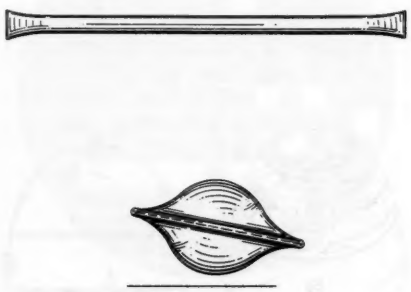
317,541
CUSHION FOR THE BACK OF A CHAIR OR THE LIKE
Elizabeth H. Carwile, 113 Hickory Creek Dr., Brandon, Fla. 33511
Filed Sep. 25, 1989, Ser. No. 411,626
Term of patent 14 years
U.S. Cl. D6—601



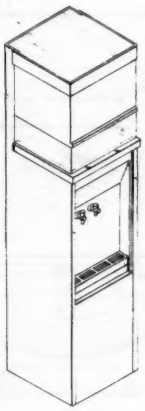
317,542
BED LINEN
Terrance W. Sachetti, 5930 W. Broadway #9, Crystal, Minn. 55428
Filed Nov. 28, 1989, Ser. No. 442,182
Term of patent 14 years
U.S. Cl. D6—603



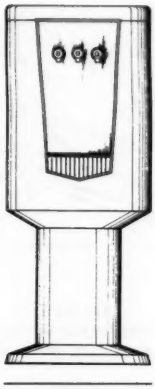
317,543
COMBINED CONTAINER, STIRRER AND DRINKING STRAW
Robert A. Small, 1220 Manhattan Ave., Ste. A, Manhattan Beach, Calif. 90266
Filed Nov. 24, 1986, Ser. No. 934,616
Term of patent 14 years
U.S. Cl. D7—300.2



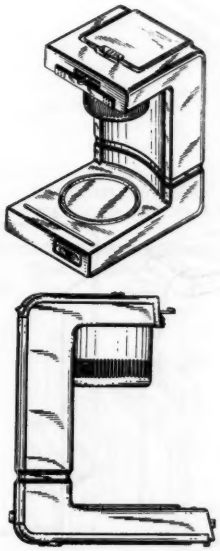
317,544
WATER DISPENSER
Rutledge Bermingham, Rye, N.Y., assignor to Back Bone Water Company, Rye, N.Y.
Filed Oct. 28, 1988, Ser. No. 264,161
Term of patent 14 years
U.S. Cl. D7—307



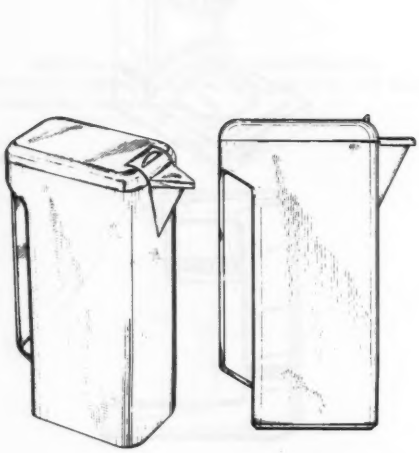
317,545
WATER DISPENSER
Lloyd W. Lambert, 201 Vanderpool La.#604, Houston, Tex. 77024; Joe A. Brown, 9715 Burdine, Houston, Tex. 77096, and John L. Morgan, 8817 Merlin Dr., Houston, Tex. 77055
Filed Oct. 31, 1988, Ser. No. 264,679
Term of patent 14 years
U.S. Cl. D7—307



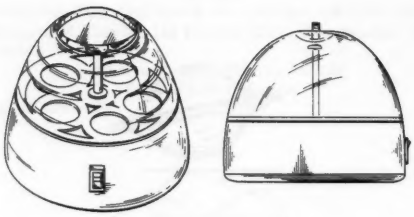
317,546
COFFEE MAKER
William J. Rakocy, Madison; Ronald L. Muller, Old Saybrook, and Masao Tsuji, Old Lyme, all of Conn., assignors to North American Philips Corporation, New York, N.Y.
Filed Jul. 11, 1988, Ser. No. 217,571
Term of patent 14 years
U.S. Cl. D7—309



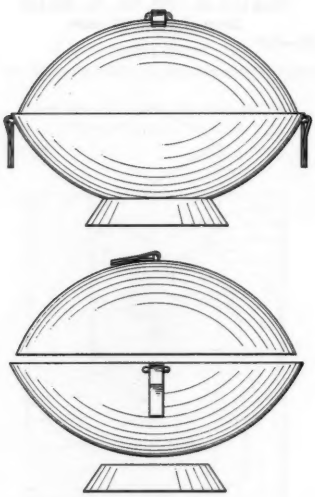
317,547
CARAFE
Bruno Gecchelin, Milan, Italy, assignor to Fratelli Guzzini, S.p.A., Recanati, Italy
Filed Apr. 13, 1988, Ser. No. 181,258
Term of patent 14 years
U.S. Cl. D7—317



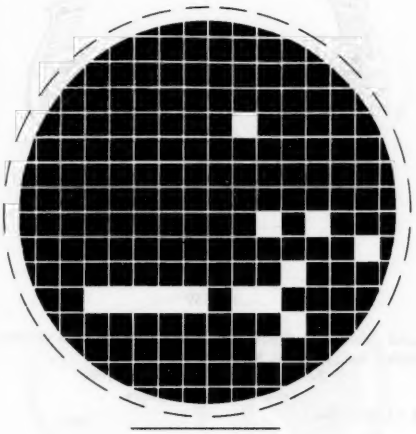
317,548
ELECTRIC EGG COOKER
Stanley Yeh, Taipei, Taiwan, assignor to 501 Giant Up Co., Ltd., Taipei, Taiwan
Filed Jul. 18, 1988, Ser. No. 232,633
Term of patent 14 years
U.S. Cl. D7—357



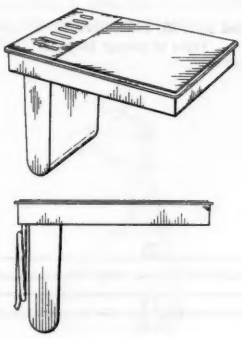
317,549
CAMPER'S WOK
C. Richard Stadelmaier, 505 E. 41st St., Baltimore, Md. 21218
Filed Sep. 2, 1988, Ser. No. 240,119
Term of patent 14 years
U.S. Cl. D7—360



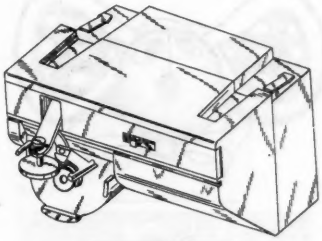
317,550
SURFACE DECORATION FOR THE BOTTOM EXTERIOR OF A COOKING PAN
Francois Elie, Paris, France, assignor to Terraillon, Annemasse, France
Filed Feb. 2, 1988, Ser. No. 151,645
Claims priority, application France, Aug. 6, 1987, 87 4669
Term of patent 14 years
U.S. Cl. D7—402



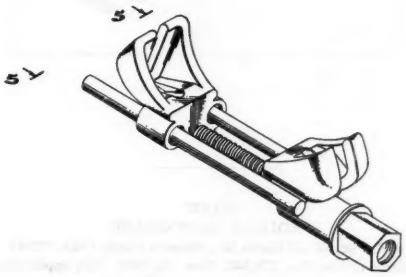
317,551
COMBINATION KNIFERACK, CUTTING BOARD AND DRAIN
Donald G. King, 3140 Wharton Way, Mississauga, Ontario, Canada L4X 2C1
Filed Jun. 7, 1989, Ser. No. 362,593
Claims priority, application Canada, Mar. 9, 1989, 49-03-89-10
Term of patent 14 years
U.S. Cl. D7—638



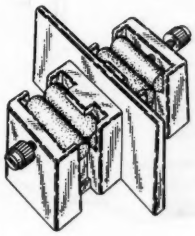
317,552
ELECTRICALLY POWERED CAN OPENER
Don R. McCloskey, Stratford, Conn.; Gary van Deursen, Upper Saddle River, N.J., and Sally A. Hattle, Wilmington, Del., assignors to Black & Decker Inc., Newark, Del.
Filed Apr. 26, 1989, Ser. No. 344,147
Term of patent 14 years
U.S. Cl. D8—36



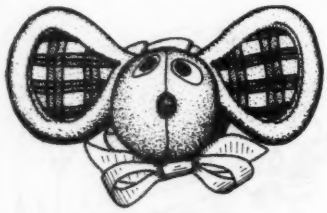
317,553
CHAIN SHORTENER
Shigemi J. Nakagiri, 11408 Barman St., Culver City, Calif. 90230
Filed Nov. 4, 1988, Ser. No. 266,993
Term of patent 14 years
U.S. Cl. D8—44



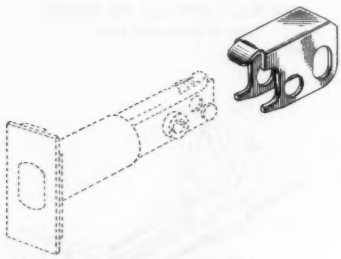
317,554
KNIFE SHARPENER
Raymond A. Young, 2615 SE. Courtney, Sp. 8, Milwaukie, Oreg. 97222
Filed Jun. 6, 1988, Ser. No. 202,992
Term of patent 14 years
U.S. Cl. D8—93



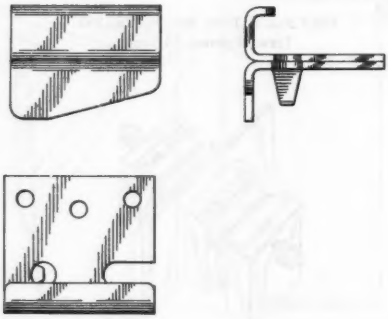
317,555
MOUSE DOOR KNOB COVER
Mary C. Guberman, c/o Kensington Designs, Inc., 11508 Applejack Ct., Cincinnati, Ohio 45241
Filed May 20, 1988, Ser. No. 196,919
Term of patent 14 years
U.S. Cl. D8—322



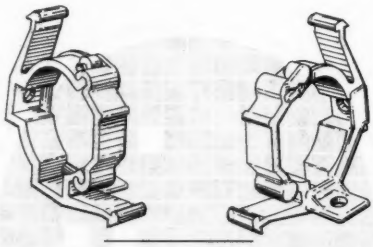
317,556
PROTECTIVE SHIELD FOR A DEADBOLT ASSEMBLY
John L. McKernan, 32 Province St., Boston, Mass. 02108
Filed Oct. 19, 1988, Ser. No. 259,695
Term of patent 14 years
U.S. Cl. D8—346



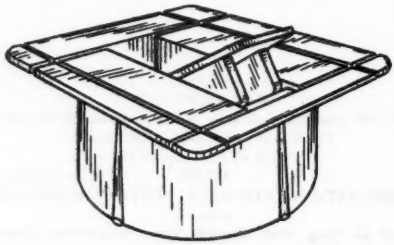
317,557
PADLOCK HASP GUARD
Lloyd R. Poe, 28122 Haria St., Mission Viejo, Calif. 92692
Division of Ser. No. 275,540, Nov. 25, 1988. This application Nov. 5, 1990, Ser. No. 609,217
Term of patent 14 years
U.S. Cl. D8—346



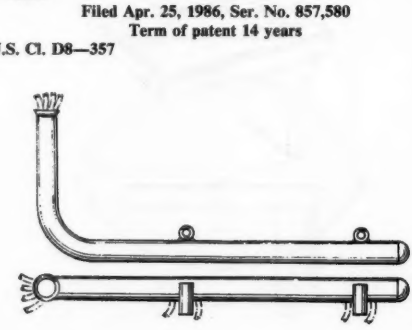
317,558
MODULAR CONDUIT SUPPORT
Robert V. Daigle, Deerfield Beach, Fla., and Gordon J. Grice, Janesville, Wis., assignors to Creative Engineering Systems, Janesville, Wis.
Filed Nov. 27, 1989, Ser. No. 441,405
Term of patent 14 years
U.S. Cl. D8—354



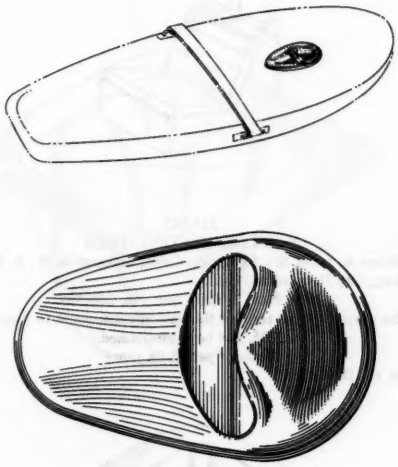
317,559
GROMMET
Ronald Simonton, Stonington, Conn., assignor to Herman Miller, Inc., Zeeland, Mich.
Filed Jan. 8, 1990, Ser. No. 461,799
Term of patent 14 years
U.S. Cl. D8—356



317,560
AUTO WIRING MANIFOLD
Kenneth Skaggs, 1335 Jefferson Rd., Hoffman Estates, Ill. 60195
Filed Apr. 25, 1986, Ser. No. 857,580
Term of patent 14 years
U.S. Cl. D8—357

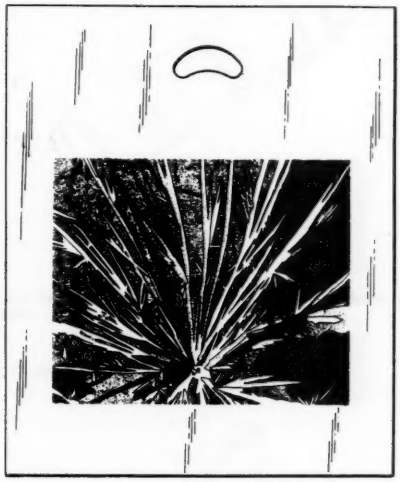


317,561
TETHER RETAINER FOR SURF BOARDS OR THE LIKE
Alan W. Stubbings, Mojave, Calif., assignor to John G. Tamborrino, Lancaster, Calif.
Filed Nov. 21, 1988, Ser. No. 274,124
Term of patent 14 years
U.S. Cl. D8—367



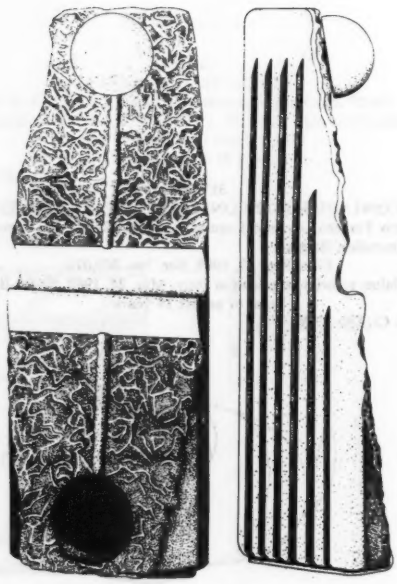
317,562
SPRAYER BOTTLE
Daniel Lami, Brindas, France, assignor to Etablissements Perras, Villefranche, France
Filed Dec. 7, 1988, Ser. No. 281,007
Term of patent 14 years
U.S. Cl. D9—300

317,563
BAG
Harriett M. Spry, Worcester Park, England, assignor to Beecham Group p.l.c., Brentford, England
Filed Nov. 18, 1988, Ser. No. 273,869
Claims priority, application United Kingdom, May 20, 1988, 1050885
Term of patent 14 years
U.S. Cl. D9—305

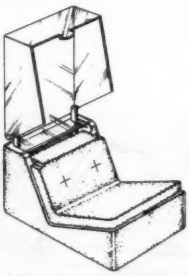


317,564
CONTAINER FOR CONFECTIONERY PRODUCTS
Pietro Ferrero, Avenue Lequim 62, 1640 Rhode St., Genese, Bruxelles, Belgium
Filed Sep. 23, 1988, Ser. No. 249,074
Claims priority, application Italy, Mar. 24, 1988, 53009-B/88
Term of patent 14 years
U.S. Cl. D9—318

317,565
BOTTLE
Gaetano Pesce, Canaregio, Italy, assignor to Societe Generale Des Eaux Minerales De Vittel, Vittel, France
Filed Jan. 20, 1987, Ser. No. 4,686
Claims priority, application France, Jul. 18, 1986, 151
Term of patent 14 years
U.S. Cl. D9—367



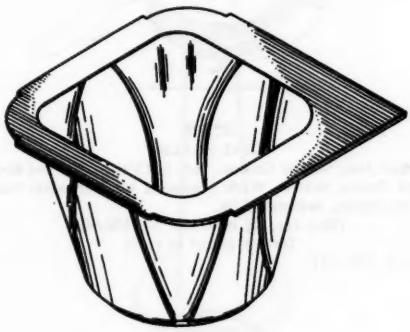
317,566
ARTICLE DISPLAY BOX
Dino L. Garganese, 40 Celestia Ct., N. Kingston, R.I. 02852
Filed Apr. 5, 1988, Ser. No. 177,597
Term of patent 14 years
U.S. Cl. D9—420



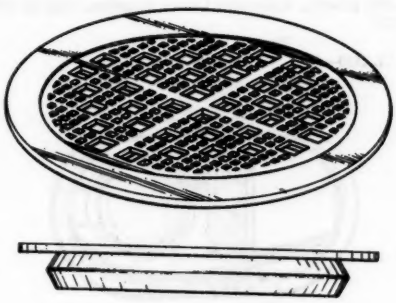
317,567
PACKAGING CONTAINER
William A. Lane, Sr., Redlands, Calif., assignor to W. A. Lane, Inc., San Bernardino, Calif.
Filed Nov. 2, 1988, Ser. No. 266,359
The portion of the term of this patent subsequent to Jun. 18, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D9—425

317,568
PACKAGING CONTAINER
William A. Lane, Sr., Redlands, Calif., assignor to W.A. Lane, Inc., San Bernardino, Calif.
Filed Nov. 2, 1988, Ser. No. 266,358
The portion of the term of this patent subsequent to Jun. 18, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D9—425

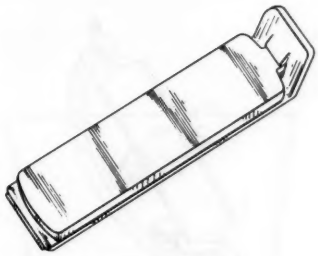
317,569
PACKAGING CONTAINER
William A. Lane, Sr., Redlands, Calif., assignor to W. A. Lane, Inc., San Bernardino, Calif.
Filed Nov. 2, 1988, Ser. No. 266,357
The portion of the term of this patent subsequent to Jun. 18, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D9—425



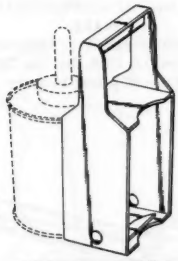
317,570
CONTAINER FILTER
Lewis Kryk, Windsor, Canada, assignor to Diversey Corporation, Mississauga, Canada
Filed Sep. 23, 1988, Ser. No. 248,036
Term of patent 14 years
U.S. Cl. D9—434



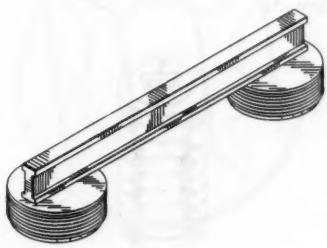
317,571
BAG CLIP
Kjell Henriksson, Bredaryd, Sweden, assignor to Linden International AB, Varnamo, Sweden
Filed May 9, 1989, Ser. No. 349,150
Claims priority, application Sweden, Nov. 9, 1988, 88-2557
Term of patent 14 years
U.S. Cl. D9—443



317,572
CONTAINER HOLDER
Hartley Logsdon, 900 S. Dixie Hwy., West Palm Beach, Fla. 33401
Filed Jul. 12, 1988, Ser. No. 218,387
Term of patent 14 years
U.S. Cl. D9—455



317,573
ALIGNMENT BAG
Paul Step, Toronto, Canada, assignor to 501 Romet Limited, Canada
Filed Apr. 5, 1989, Ser. No. 333,494
Claims priority, application Canada, Oct. 5, 1988, 05-10-88-6
Term of patent 14 years
U.S. Cl. D10—64



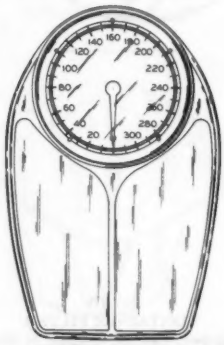
317,574
THEODOLITE OR SIMILAR ARTICLE
Roger Chen, Rm. 1002, No. 346, Nanking E. Road Sec. 3, Taipei, China
Filed Apr. 18, 1988, Ser. No. 182,565
Claims priority, application China, Aug. 5, 1987, 76304665
Term of patent 14 years
U.S. Cl. D10—66

317,575
DEVICE FOR HANGING SUSPENDED OBJECTS ON A WALL
David L. Ramsey, 6051 Scenic Ave., Hollywood, Calif. 90068
Filed Oct. 17, 1988, Ser. No. 258,455
Term of patent 14 years
U.S. Cl. D10—71

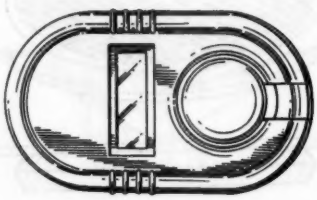
317,576
DIGITAL CLOCK
Sanae Aoki, and Tsunataka Konoike, both of Tokyo, Japan, assignors to Tanaka Manufacturing Company Limited, Tokyo, Japan
Filed Aug. 21, 1987, Ser. No. 88,104
Term of patent 14 years
U.S. Cl. D10—15

317,577
WATCH CASE
Martin Eiss, Freeport, N.Y., assignor to Ajco Jewelry Co. Inc., New York, N.Y.
Filed Jul. 18, 1988, Ser. No. 220,817
Term of patent 14 years
U.S. Cl. D10—30

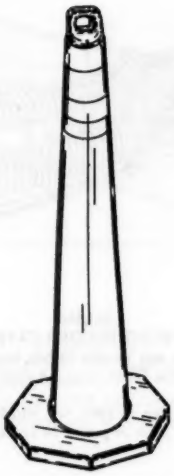
317,578
DIAL SCALE
Michael Joss; Stanley Gresens, both of Chicago, Ill., and Richard Fraker, Seattle, Wash., assignors to Continental Scale Corporation, Bridgeview, Ill.
Filed Apr. 12, 1989, Ser. No. 336,668
Term of patent 14 years
U.S. Cl. D10—92



317,579
COMBINED FLUID ALERT AND THERMOMETER
Ram Shalvi, Hong Kong, Hong Kong, assignor to Solar Wide Industrial Limited, Kowloon, Hong Kong
Filed Jun. 15, 1989, Ser. No. 367,099
Claims priority, application United Kingdom, May 25, 1989, 1059723
Term of patent 14 years
U.S. Cl. D10—101

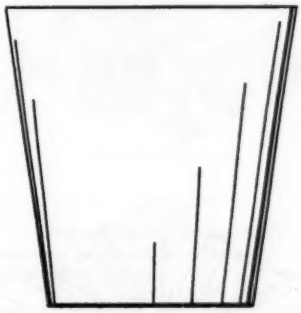


317,580
SAFETY ROAD CHANNELIZER
Kurt W. Thurston, 475 Hill St., Reno, Nev. 89501
Filed Apr. 21, 1987, Ser. No. 40,627
Term of patent 14 years
U.S. Cl. D10—109

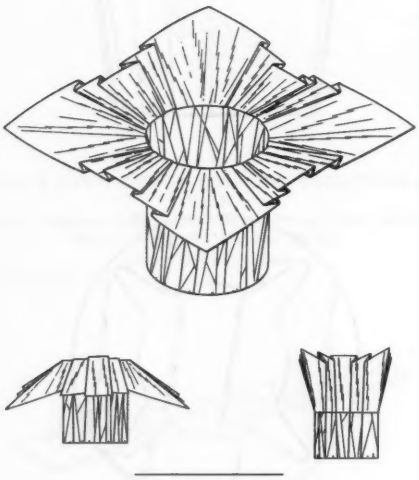


317,581
DRUM BOY FIGURINE OR SIMILAR ARTICLE
Nam J. Yeu, Seoul, Rep. of Korea, assignor to Michael & Park's Trading and Sales, Inc., Honolulu, Hi.
Continuation-in-part of Ser. No. 947,487, Dec. 29, 1986, abandoned. This application Apr. 6, 1989, Ser. No. 334,126
Term of patent 14 years
U.S. Cl. D11—160

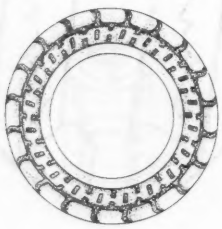
317,582
FLOWER POT COVER
Donald E. Weder, Highland, Ill., assignor to Highland Supply Corporation, Highland, Ill.
Filed Apr. 13, 1989, Ser. No. 337,447
The portion of the term of this patent subsequent to May 21, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D11—164



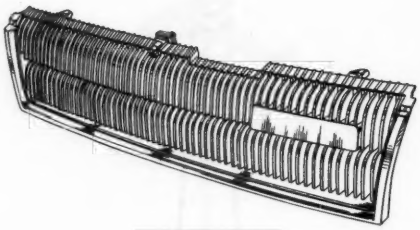
317,583
FLOWER POT COVER
Donald E. Weder; Erwin H. Weder, both of Highland, Ill.; Wanda M. Weder, Highland, Calif.; Franklin J. Craig, Valley Park, Mo.; Wilma M. Donnelly, Highland, Ill.; Phyllis J. Bolk, Highland, Ill.; John W. Bergstrand, Highland, Ill., and Robert C. Abrams, Edwardsville, Ill., assignors to Highland Supply Corporation, Highland, Ill.
Continuation-in-part of Ser. No. 613,053, May 22, 1984, Pat. No. Des. 293,224. This application Oct. 13, 1987, Ser. No. 108,023
The portion of the term of this patent subsequent to Apr. 2, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D11—164



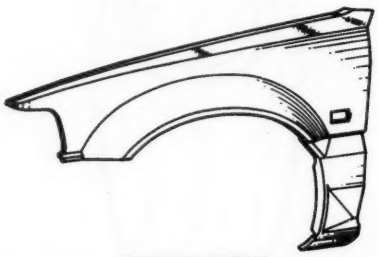
317,584
VEHICLE TIRE
Kotaro Tsutsumi, Tokyo, Japan, assignor to The Ohtsu Tire & Rubber Co., Ltd., Izumi-Ohtsu, Japan
Filed Apr. 12, 1988, Ser. No. 180,863
Claims priority, application Japan, Dec. 10, 1987, 62-50712
Term of patent 14 years
U.S. Cl. D12—151



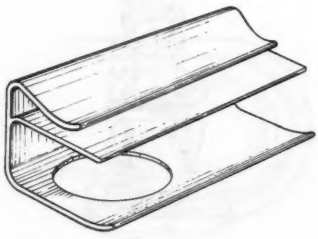
317,585
GRILL FOR AUTOMOBILE RADIATOR
Akira Uchida, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan
Filed Apr. 28, 1988, Ser. No. 187,631
Term of patent 14 years
U.S. Cl. D12—163



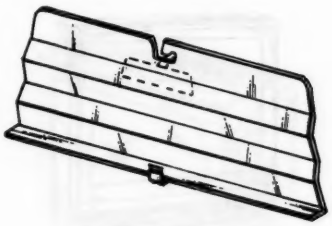
317,586
AUTOMOBILE FRONT FENDER EXTERIOR SURFACE
Fujimura Yoshinao, and Yusuke Saitoh, both of Tokyo, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 9, 1987, Ser. No. 94,538
Term of patent 14 years
U.S. Cl. D12—184



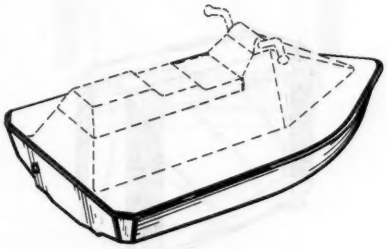
317,587
VISOR ATTACHABLE HOLDER FOR A MICROCASSETTE RECORDER
Guy A. Chembars, P.O. Box 229, Broadway, N.J. 08808
Filed May 2, 1988, Ser. No. 189,680
Term of patent 14 years
U.S. Cl. D12—191



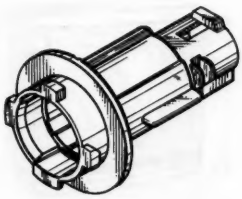
317,588
VEHICLE WINDSHIELD SHADE OR SIMILAR ARTICLE
Michael R. Pluta, 16748 Algonquin, Huntington Beach, Calif. 92649
Filed Jan. 23, 1989, Ser. No. 299,814
Term of patent 14 years
U.S. Cl. D12—191



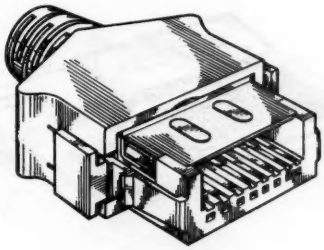
317,589
WATERCRAFT
Jack Sutherland, Springfield, Mo., assignor to Dynamic Products, Inc., Springfield, Mo.
Filed Oct. 31, 1989, Ser. No. 429,352
Term of patent 14 years
U.S. Cl. D12—318



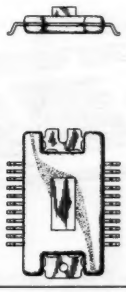
317,590
AUTOMOBILE BULB SOCKET
Ken Matsuoka; Kihachiro Uchida, both of Shizuoka; Kazuya Horiuchi, and Hiroyuki Hayashi, both of Mie, all of Japan, assignors to Koito Manufacturing Co., Ltd., Mie, Japan
Filed Aug. 21, 1987, Ser. No. 87,949
Claims priority, application Japan, Feb. 26, 1987, 62-7260
Term of patent 14 years
U.S. Cl. D13—134



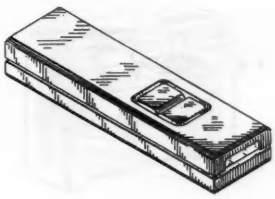
317,591
ELECTRICAL CONNECTOR PLUG
Shuichi Matsuzaki, Tokyo, Japan, assignor to Hirose Electric Co., Ltd., Tokyo, Japan
Filed Aug. 26, 1988, Ser. No. 237,006
Claims priority, application Japan, Mar. 7, 1988, 63-9203
Term of patent 14 years
U.S. Cl. D13—147



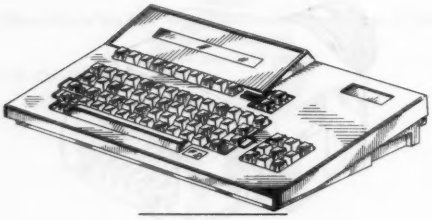
317,592
SEMICONDUCTOR ELEMENT
Tetsuo Yoshizawa, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 2, 1987, Ser. No. 69,579
Claims priority, application Japan, Jan. 19, 1987, 62-1597
Term of patent 14 years
U.S. Cl. D13—182



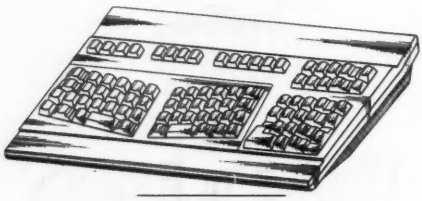
317,593
TRANSMITTER FOR WIRELESS SWITCH
Michael J. Rowen, Center Valley, Pa., assignor to Lutron Electronics Co., Inc., Coopersburg, Pa.
Filed Sep. 26, 1988, Ser. No. 249,463
The portion of the term of this patent subsequent to Sep. 26, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D13—168



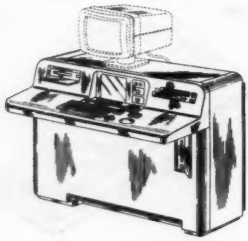
317,594
KEYBOARD
Michael M. Richardson, Eden Prairie, Minn., and Geoff Ringle, Trenton, N.J., assignors to Kroy Inc., Scottsdale, Ariz.
Filed Jan. 31, 1989, Ser. No. 304,416
Term of patent 14 years
U.S. Cl. D14—100



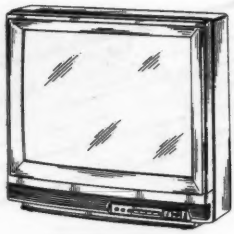
317,595
KEYBOARD FOR DATA PROCESSING SYSTEM
Isamu Yoshitake, Fuchu, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Feb. 27, 1989, Ser. No. 316,448
Claims priority, application Japan, Apr. 28, 1988, 63-17391
Term of patent 14 years
U.S. Cl. D14—100



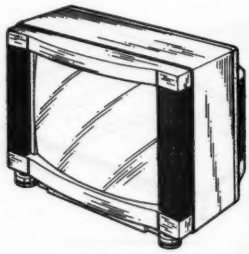
317,596
OPERATOR CONSOLE FOR MAGNETIC RESONANCE IMAGING SYSTEM
Isamu Takekoshi; Mitsuru Onuma, both of Tokyo; Kazuki Torai, Kokubunji; Kazunori Hashimoto, Tachikawa, and Toshiaki Aritomi, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Aug. 4, 1989, Ser. No. 389,566
Claims priority, application Japan, Mar. 20, 1989, 1-9800
Term of patent 14 years
U.S. Cl. D14—103



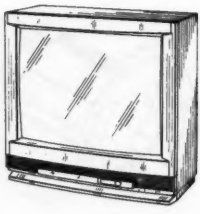
317,597
TELEVISION RECEIVER
Masahiro Kawanabe, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Feb. 22, 1989, Ser. No. 313,805
Claims priority, application Japan, Aug. 23, 1988, 63-33030
Term of patent 14 years
U.S. Cl. D14—126



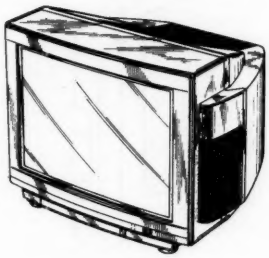
317,598
TELEVISION SET
Jong M. Park, Seoul, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea
Filed Aug. 24, 1989, Ser. No. 400,024
Claims priority, application Rep. of Korea, Mar. 22, 1989, 89-3486
Term of patent 14 years
U.S. Cl. D14—126

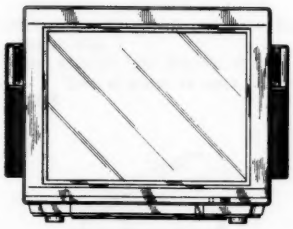


317,599
TELEVISION RECEIVER
Masahiro Kawanabe, Tokyo, and Kanta Takechi, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jul. 19, 1989, Ser. No. 381,936
Claims priority, application Japan, Feb. 23, 1989, 1-6450
Term of patent 14 years
U.S. Cl. D14—126

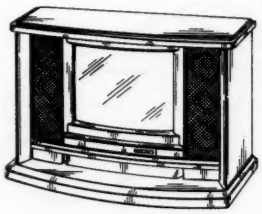


317,600
TELEVISION RECEIVER
Yoshiaki Amano; Kenta Kumagai, both of Tokyo; Fumihito Katou, Ichikawa; Kouichi Kasama, and Tooru Kiyota, both of Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Aug. 10, 1989, Ser. No. 392,151
Term of patent 14 years
U.S. Cl. D14—126

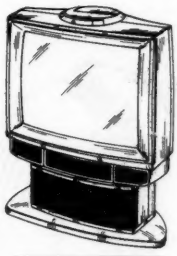




317,601
TELEVISION RECEIVER
Masahiro Kawanabe, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Sep. 14, 1989, Ser. No. 407,133
Claims priority, application Japan, Mar. 23, 1989, 1-10159
Term of patent 14 years
U.S. Cl. D14—133

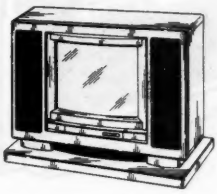


317,602
TELEVISION RECEIVER
Tatsuyuki Mikami, Ichikawa, and Kaoru Tanaka, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Sep. 14, 1989, Ser. No. 407,025
Claims priority, application Japan, Mar. 23, 1989, 1-10160
Term of patent 14 years
U.S. Cl. D14—133

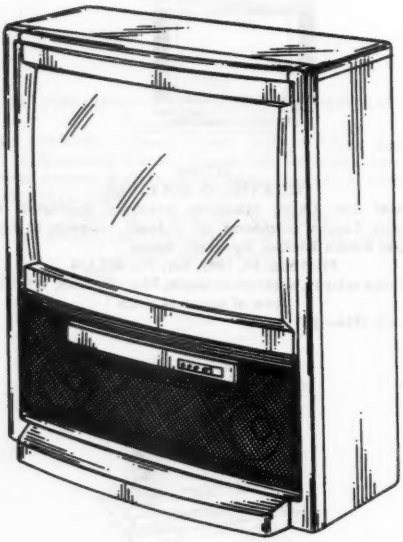


317,603
TELEVISION RECEIVER
Masahiro Kawanabe, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Nov. 15, 1989, Ser. No. 436,677
Claims priority, application Japan, May 16, 1989, 1-17542
Term of patent 14 years
U.S. Cl. D14—133

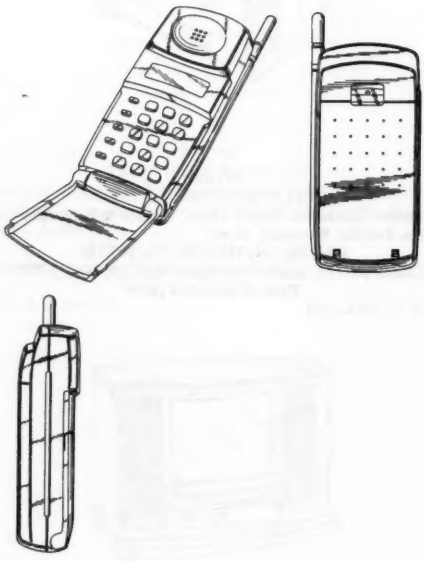
317,604
TELEVISION RECEIVER
Takashi Abe, Chiba; Michihiro Nakahara, Koshigaya, and Kaoru Tanaka, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Sep. 14, 1989, Ser. No. 407,134
Claims priority, application Japan, Mar. 23, 1989, 1-10158
Term of patent 14 years
U.S. Cl. D14—133



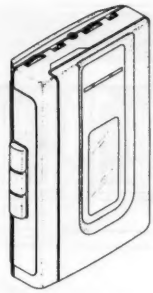
317,605
TELEVISION RECEIVER
Kimiyoshi Ban, Kasukabe, and Takashi Abe, Chiba, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Sep. 5, 1989, Ser. No. 402,430
Claims priority, application Japan, Mar. 7, 1989, 1-8042
Term of patent 14 years
U.S. Cl. D14—133



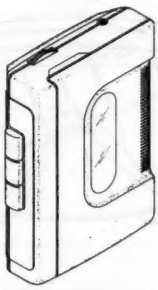
317,606
PORTABLE TELEPHONE
Toru Irie; Isamu Fukuda, both of Yokohama, and Hisamitsu Takagi, Inagi, all of Japan, assignors to Fujitsu Limited, Kanagawa, Japan
Filed Oct. 11, 1990, Ser. No. 595,494
Term of patent 14 years
U.S. Cl. D14—138



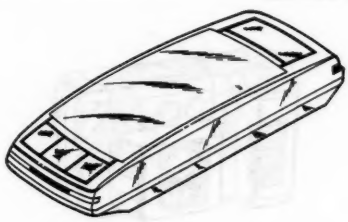
317,607
COMBINED STEREO RADIO AND CASSETTE PLAYER
Ronald Emmerling, Bay Head, N.J., assignor to Gemini Industries Inc., Clifton, N.J.
Filed May 15, 1989, Ser. No. 351,913
Term of patent 14 years
U.S. Cl. D14—163



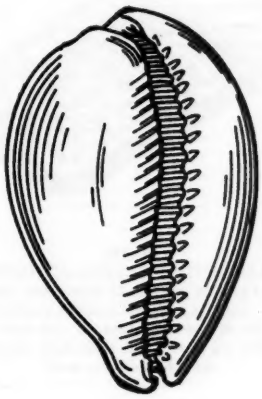
317,608
STEREO CASSETTE PLAYER
Ronald Emmerling, Bay Head, N.J., assignor to Gemini Industries Inc., Clifton, N.J.
Filed May 15, 1989, Ser. No. 352,031
Term of patent 14 years
U.S. Cl. D14—165



317,609
TAPE REWINDER
Joe Wei, No. 125, Wan Shou Road, Sec. 3, Taoyuan Hsien, Taiwan
Filed Feb. 10, 1989, Ser. No. 308,694
Term of patent 14 years
U.S. Cl. D14—217

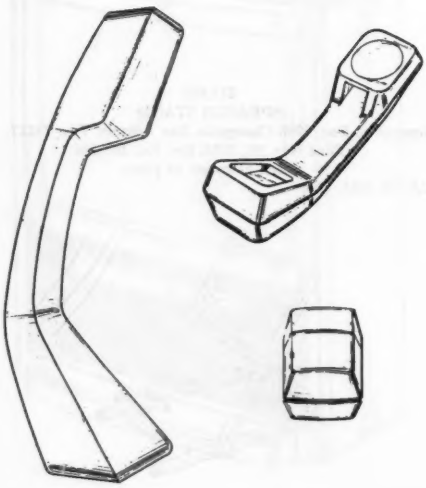


317,610
HEADPHONE EARPIECE
Nicolette A. Jahnke, 4489 Murietta Ave., #8, Sherman Oaks, Calif. 91423
Filed Oct. 7, 1988, Ser. No. 255,538
Term of patent 14 years
U.S. Cl. D14—223

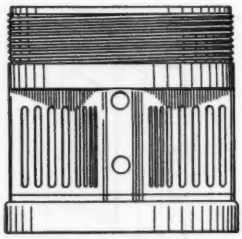


317,611
SPEAKER STAND
Kenneth A. Poe, 4956 Champlain, San Antonio, Tex. 78217
Filed Nov. 10, 1988, Ser. No. 269,166
Term of patent 14 years
U.S. Cl. D14—224

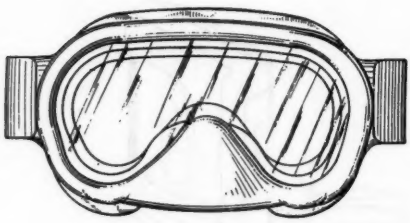
317,612
TELEPHONE HANDSET
Gary K. Dalton, Woodbridge, England, assignor to British Telecommunications public limited company, London, England
Filed Aug. 16, 1989, Ser. No. 394,332
Claims priority, application United Kingdom, Feb. 16, 1989, 1057179
Term of patent 14 years
U.S. Cl. D14—248



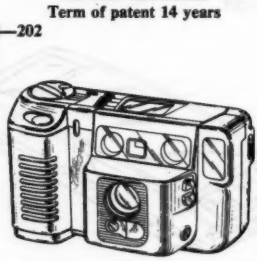
317,613
SUCTION INLET BOWL FOR A SUBMERSIBLE PUMP
Alan B. Channell, Ashland, Ohio, assignor to McNeil (Ohio) Corporation, St. Paul, Minn.
Filed Nov. 18, 1988, Ser. No. 273,001
Term of patent 14 years
U.S. Cl. D15—7



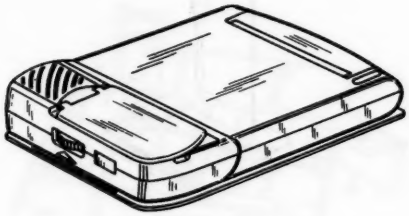
317,614
GOGGLES
Franz Dianitsch, Lerchenau 3, 4020 Leonding, Austria
Filed Jun. 15, 1987, Ser. No. 62,827
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1987, 17040
Term of patent 14 years
U.S. Cl. D16—102



317,615
ELECTRONIC STILL VIDEO CAMERA
Nobuo Kikuchi, Tokyo, and Hiroshi Sano, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 2, 1988, Ser. No. 201,162
Claims priority, application Japan, Dec. 2, 1987, 62-49498
The portion of the term of this patent subsequent to May 7, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D16—202



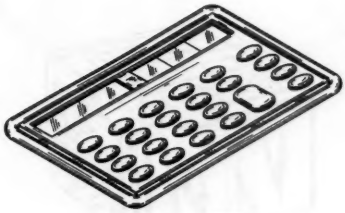
317,616
OVERHEAD PROJECTOR
Minoru Shiiba, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Sep. 30, 1988, Ser. No. 251,574
Claims priority, application Japan, Apr. 13, 1988, 63-14920
Term of patent 14 years
U.S. Cl. D16—232



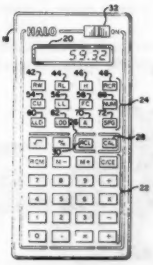
317,617
DOUBLE POINTED GUITAR PICK
Glenn W. Mutti, 1455 Madison Ave., Bridgeport, Conn. 06606
Filed Sep. 2, 1988, Ser. No. 239,848
Term of patent 14 years
U.S. Cl. D17—20

317,618
ELECTRONIC CALCULATOR
Masaji Sawada, and Kouji Nishida, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Oct. 16, 1989, Ser. No. 421,693
Claims priority, application Japan, Apr. 19, 1989, 1-14485
Term of patent 14 years
U.S. Cl. D18—7

317,619
ELECTRONIC CALCULATOR WITH SOLAR CELL
Masaji Sawada, and Youko Yoshimura, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Oct. 27, 1989, Ser. No. 428,754
Claims priority, application Japan, Apr. 27, 1989, 1-16293
Term of patent 14 years
U.S. Cl. D18—7



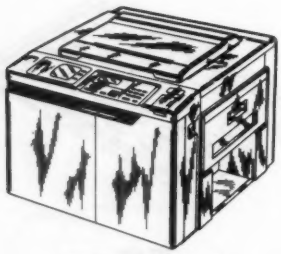
317,620
LIGHTING CALCULATOR
Raymond J. Kusmer, La Habra, Calif., assignor to Cooper Industries, Inc., Houston, Tex.
Filed Mar. 31, 1988, Ser. No. 176,813
Term of patent 14 years
U.S. Cl. D18—7



317,621
TYPE FONT
Sumner R. Stone, Palo Alto, Calif., assignor to Adobe Systems Incorporated, Mountain View, Calif.
Filed May 11, 1988, Ser. No. 193,316
Term of patent 14 years
U.S. Cl. D18—24

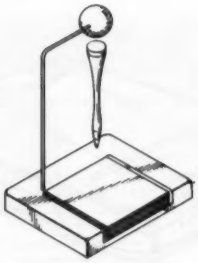
ABCDEFJ
KLNOPQR
STUVWXYZ
abcdefgij
klmnopqr
stuvwxyz$^{a\,o}$

317,622
COPYING MACHINE
Masataka Isomoto, Kawasaki; Minoru Aoyama, Tokyo, and Mitsuru Sakurai, Musashino, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 18, 1989, Ser. No. 381,172
Claims priority, application Japan, Jan. 19, 1989, 1-1657
Term of patent 14 years
U.S. Cl. D18—38



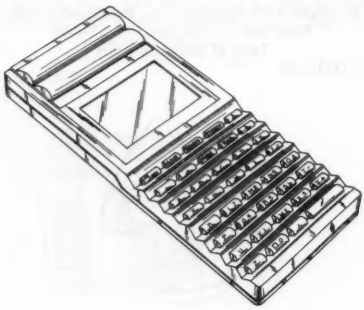
317,623
GREETING CARD
Edward Piechocki, R.D. 1, P.O. Box 4078, Upper Black Eddy, Pa. 18972
Filed Dec. 14, 1989, Ser. No. 450,730
Term of patent 14 years
U.S. Cl. D19—1

317,624
COMBINED PEN AND MAGNETIC HOLDER THEREFOR
William R. Jurinjak, 728 W. 1720 N.#216, Provo, Utah
Filed Aug. 24, 1988, Ser. No. 235,632
Term of patent 14 years
U.S. Cl. D19—42

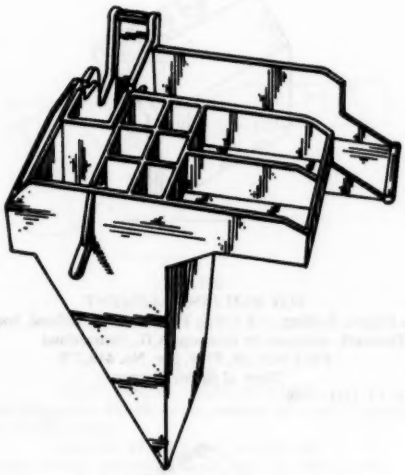


317,625
PEN CAP OR SIMILAR ARTICLE
Kunio Itoh, Funabashi, Japan, assignor to Pentel Kabushiki Knisha, Japan
Division of Ser. No. 935,558, Nov. 26, 1986, Pat. No. Des. 310,684. This application Aug. 13, 1990, Ser. No. 567,901
Term of patent 14 years
U.S. Cl. D19—57

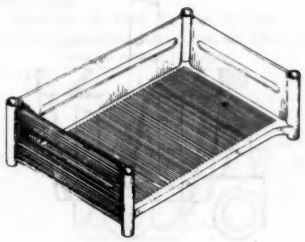
317,626
PORTABLE ELECTRONIC DICTIONARY
Peter H. Muller, Los Gatos, Calif., assignor to Alexander H. Hwang, Moraga, Calif.
Filed Mar. 7, 1990, Ser. No. 489,520
Term of patent 14 years
U.S. Cl. D19—60



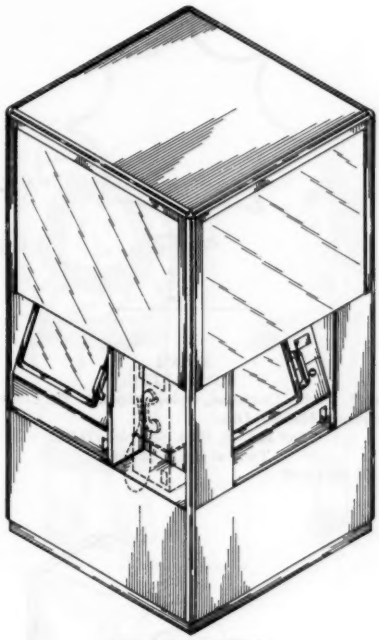
317,627
HOLDER FOR ASSORTED DESK ARTICLES
Theodore P. Lapadakis, 9827 Mason Ave., Chatsworth, Calif. 91311
Filed Mar. 7, 1988, Ser. No. 164,993
Term of patent 14 years
U.S. Cl. D19—75



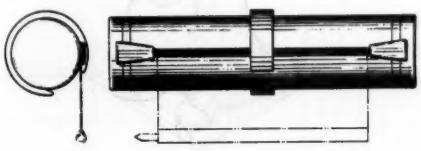
317,628
DESK TRAY
Mel Evenson, San Pedro, Calif., assignor to Eldon Industries, Inc., Inglewood, Calif.
Filed Sep. 28, 1987, Ser. No. 101,770
Term of patent 14 years
U.S. Cl. D19—92



317,629
NEWSPAPER VENDING KIOSK
Jack S. Chalabian, Huntington Beach, Calif., assignor to K-Jack Engineering Company, Inc., Gardena, Calif.
Filed Jul. 13, 1988, Ser. No. 218,024
Term of patent 14 years
U.S. Cl. D20—6

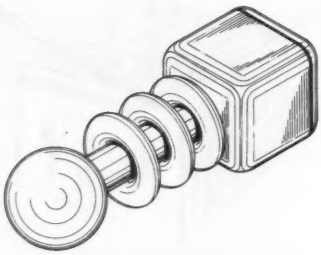


317,630
RETRACTABLE ROLLER DIRECTORY
Gaudet Allen, and Gaudet E. Allen, both of 1217 Blue Hills Ave., Bloomfield, Conn. 06002
Filed Mar. 23, 1988, Ser. No. 172,134
Term of patent 14 years
U.S. Cl. D20—42



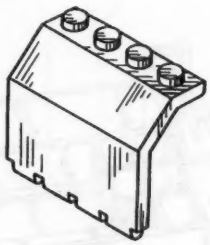
317,631
BUBBLE WAND
Richard L. Neuroth; Margerate A. B. Neuroth, both of R.R. Box 178-A, Epworth, Iowa 52045; Richard A. Robertson, and Elizabeth A. Robertson, both of 3065 Hales Mill Rd., Dubuque, Iowa 52001
Filed Jun. 13, 1989, Ser. No. 365,502
Term of patent 14 years
U.S. Cl. D21—61

317,632
TOY RATTLE
James F. Mariol, Cincinnati, Ohio, assignor to The Little Tikes Company, Hudson, Ohio
Filed Jun. 26, 1989, Ser. No. 371,012
Term of patent 14 years
U.S. Cl. D21—65



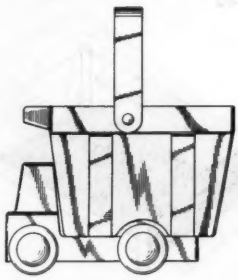
317,633
TOY SEA LION
Christian Stephensen, Marstal, and Jacob Nielsen, Copenhagen, both of Denmark, assignors to Interlego A.G., Switzerland
Filed Nov. 29, 1989, Ser. No. 443,223
Term of patent 14 years
U.S. Cl. D21—108

317,634
TOY BUILDING ELEMENT
Kim P. Larsen, Vandel, and Erling T. Dideriksen, Billund, both of Denmark, assignors to Interlego A.G., Switzerland
Filed Nov. 29, 1989, Ser. No. 443,234
Term of patent 14 years
U.S. Cl. D21—108

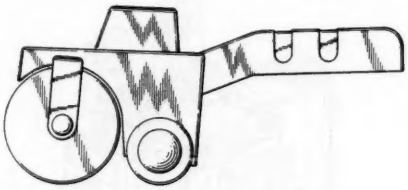


317,635
TOY BUILDING ELEMENT
Bo Eggert, Kolding, and Erling T. Dideriksen, Billund, both of Denmark, assignors to Interlego A.G., Switzerland
Filed Nov. 29, 1989, Ser. No. 443,275
Term of patent 14 years
U.S. Cl. D21—108

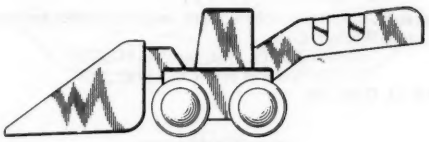
317,636
TOOL FOR PLAYING IN SAND
Masaki Mayuzumi, Tokyo, Japan, assignor to Tomy Company, Ltd., Tokyo, Japan
Filed Jul. 13, 1989, Ser. No. 379,143
Claims priority, application Japan, Jan. 18, 1989, 1-1354
Term of patent 14 years
U.S. Cl. D21—120



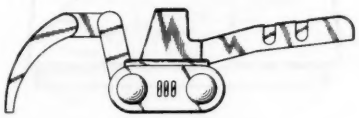
317,637
TOOL FOR PLAYING IN SAND
Masaki Masuzumi, Tokyo, Japan, assignor to Tomy Company, Ltd., Tokyo, Japan
Filed Jul. 13, 1989, Ser. No. 379,167
Claims priority, application Japan, Jan. 18, 1989, 1-1352
Term of patent 14 years
U.S. Cl. D21—120



317,638
TOOL FOR PLAYING IN SAND
Masaki Mayuzumi, Tokyo, Japan, assignor to Tomy Company, Ltd., Tokyo, Japan
Filed Jul. 13, 1989, Ser. No. 379,145
Claims priority, application Japan, Jan. 18, 1989, 1-1353
Term of patent 14 years
U.S. Cl. D21—120

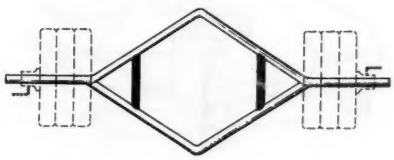


317,639
TOOL FOR PLAYING IN SAND
Masaki Mayuzumi, Tokyo, Japan, assignor to Tomy Company, Ltd., Tokyo, Japan
Filed Jul. 13, 1989, Ser. No. 379,144
Claims priority, application Japan, Jan. 18, 1989, 1-1352
Term of patent 14 years
U.S. Cl. D21—120

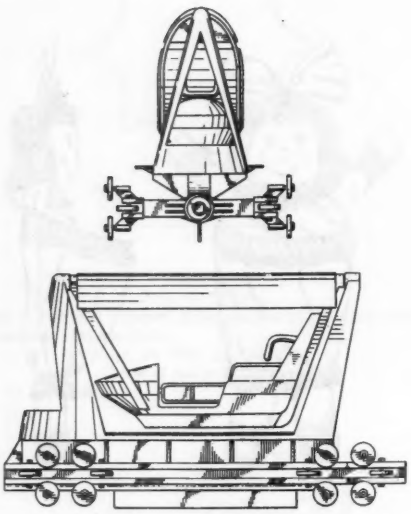


317,640
STUFFED DOLL FIGURE WITH FRONTAL POUCH
Edith A. Verone, 515 Helen St., Syracuse, N.Y. 13203
Filed May 12, 1989, Ser. No. 351,097
Term of patent 14 years
U.S. Cl. D21—167

317,641
WEIGHT LIFTING BAR
Al P. Gerard, 207 Holyoke Dr., Washington, N.C. 27889
Filed Mar. 23, 1987, Ser. No. 29,419
Term of patent 14 years
U.S. Cl. D21—197

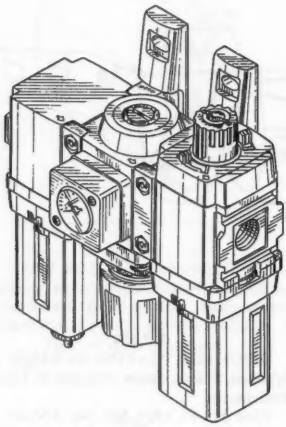


317,642
CAR FOR A ROLLER COASTER
Keizo Hashimoto, Kodaira, Japan, assignor to Midgety Engineering Co., Ltd., Tokyo, Japan
Filed Jan. 25, 1988, Ser. No. 148,397
Term of patent 14 years
U.S. Cl. D21—247

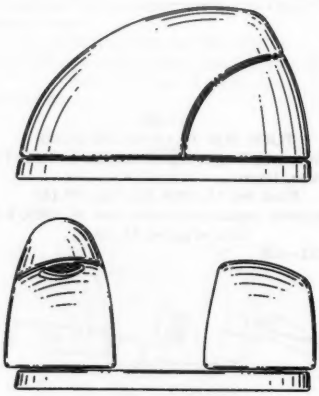


317,643
COMBINED SPRAYER AND HANDLE FOR DISHWASHING EQUIPMENT
Robert L. Duke, 4154 Arden St., Clemmons, N.C. 27012
Division of Ser. No. 111,565, Oct. 22, 1987, Pat. No. Des. 306,896. This application Dec. 4, 1989, Ser. No. 445,477
Term of patent 14 years
U.S. Cl. D23—226

317,644
COMBINED PRESSURE REGULATOR FILTER AND LUBRICATOR
Yasuyuki Ito; Tatsuaki Aoyama, both of Ichinomiya, and Hisanobu Niwa, Komaki, all of Japan, assignors to CKD Kabushiki Kaisha, Komaki, Japan
Filed Mar. 30, 1989, Ser. No. 330,739
Claims priority, application Japan, Sep. 30, 1988, 63-38442
Term of patent 14 years
U.S. Cl. D23—235

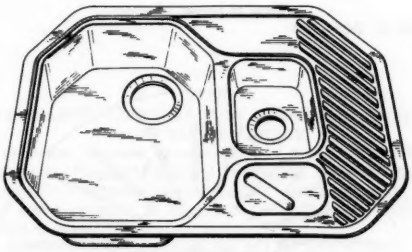


317,645
FAUCET
Kevin W. Rosenbaum, Parma, Ohio, assignor to Moen Incorporated, Windsor, Conn.
Filed Jan. 11, 1988, Ser. No. 142,221
Term of patent 14 years
U.S. Cl. D23—238

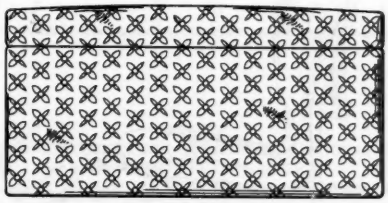


317,646
DRAIN CONTROL KNOB
Holly K. Yost, Santa Monica, Calif., assignor to Price Pfister, Inc., Pacoima, Calif.
Filed Jan. 14, 1988, Ser. No. 144,392
Term of patent 14 years
U.S. Cl. D23—252

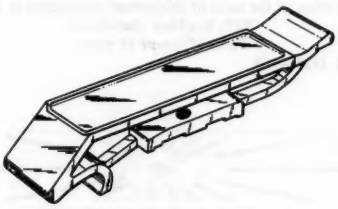
317,647
SINK
Karl-Heinz Jung, Münsingen-Dottingen, and Manfred Mück, Kürnbach, both of Fed. Rep. of Germany, assignors to Blanco GmbH & Co. KG, Oberderdingen, Fed. Rep. of Germany
Filed Mar. 17, 1988, Ser. No. 169,348
Claims priority, application Fed. Rep. of Germany, Sep. 23, 1987, 10 AR 157/87
Term of patent 14 years
U.S. Cl. D23—290



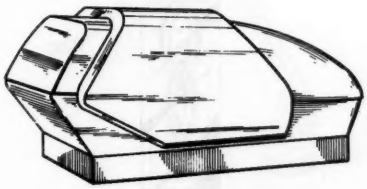
317,649
CHILD PROTECTIVE PADDED HEARTH COVER
Karen R. Alford, 407 Holly Springs Rd., Woodstock, Ga. 30188
Filed Sep. 5, 1989, Ser. No. 402,427
Term of patent 14 years
U.S. Cl. D23—403



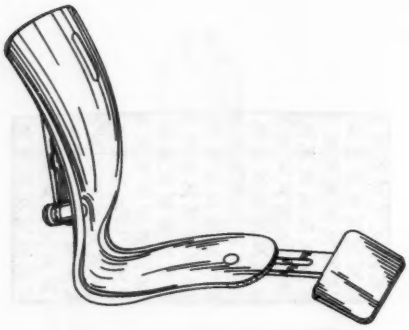
317,648
ELEMENT OF A MOVEABLE GRATE SURFACE FOR INCINERATORS
Hans B. Andersen, Mundelstrup; Allan Sorensen, Åbyhoj, and Per Jespersen, Rude, all of Denmark, assignors to B & S Miljoteknik, Arhus, Denmark
Filed Mar. 31, 1988, Ser. No. 176,342
Claims priority, application Sweden, Oct. 2, 1987, 87-2182
Term of patent 14 years
U.S. Cl. D23—397



317,650
COMBINED RELAXATION AND PSYCHOSENSORIAL STIMULATION CHAMBER
Hugo Soder, Montreux, Switzerland, assignor to New Space S.A., Switzerland
Filed Mar. 31, 1988, Ser. No. 175,727
Claims priority, application Switzerland, Oct. 8, 1987, DM/009434
Term of patent 14 years
U.S. Cl. D24—202

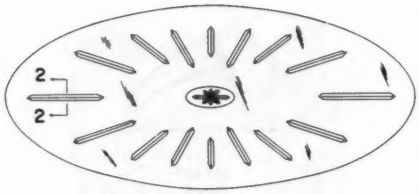


317,651
FOOT SPLINT OR THE LIKE
Harold J. Farris, 10398 104th Ave. North, Seminole; J. Marvin Winn, 1072 Fay Ave. North, Largo, both of Fla. 34641, and Joseph P. Morrissey, 13593 91st Ave. North, Seminole, Fla. 34646
Filed Sep. 20, 1988, Ser. No. 247,104
Term of patent 14 years
U.S. Cl. D24—192

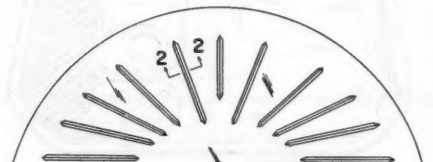


317,652
DECORATIVE GLASS PANEL
Norbert J. Guetle, Jr., Cincinnati, Ohio, and Marlin Greene, Redmond, Wash., assignors to Pease Industries, Inc., Fairfield, Ohio
Filed Jan. 30, 1989, Ser. No. 302,855
Term of patent 14 years
U.S. Cl. D25—103

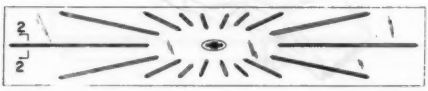
317,653
DECORATIVE GLASS PANEL
Norbert J. Guetle, Jr., Cincinnati, and B. Jeremiah Shaffer, Worthington, both of Ohio, assignors to Pease Industries, Inc., Fairfield, Ohio
Division of Ser. No. 302,867, Jan. 30, 1989, Pat. No. Des. 315,603. This application Aug. 13, 1990, Ser. No. 565,917
The portion of the term of this patent subsequent to Jun. 18, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D25—103



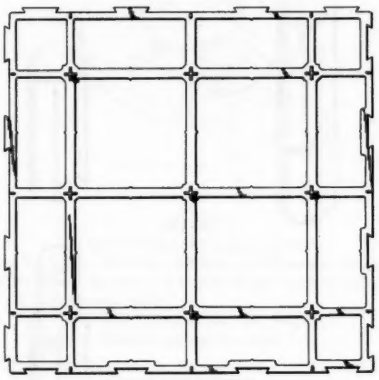
317,654
DECORATIVE GLASS PANEL
Norbert J. Guetle, Jr., Cincinnati, and B. Jeremiah Shaffer, Worthington, both of Ohio, assignors to Pease Industries, Inc., Fairfield, Ohio
Division of Ser. No. 302,865, Jan. 30, 1989, abandoned. This application Aug. 13, 1990, Ser. No. 565,916
Term of patent 14 years
U.S. Cl. D25—103



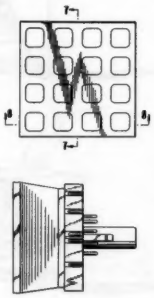
317,655
DECORATIVE GLASS PANEL
Norbert J. Guetle, Jr., Cincinnati, and B. Jeremiah Shaffer, Worthington, both of Ohio, assignors to Pease Industries, Inc., Fairfield, Ohio
Division of Ser. No. 302,860, Jan. 30, 1989, Pat. No. Des. 314,239. This application Jul. 30, 1990, Ser. No. 560,306
The portion of the term of this patent subsequent to Jun. 18, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D25—103



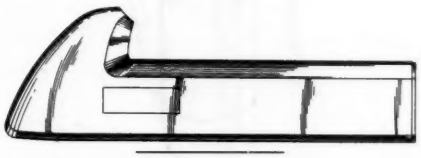
317,656
TILE MOUNTING AID
Philip L. Rea, "Melleray", 7a, Hillcrest Road, Ealing, London W5 2JL, and Stanley R. Bagshaw, 19, Georgewood Road, Hemel Hempstead, Hertfordshire HP3 8AL, both of United Kingdom
Continuation-in-part of Ser. No. 873,346, Jun. 12, 1986. This application Oct. 19, 1987, Ser. No. 109,699
Term of patent 14 years
U.S. Cl. D25—138



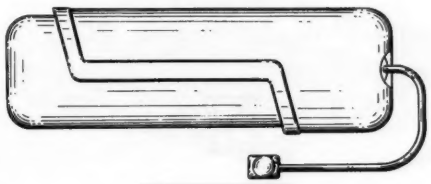
317,657
FLUORESCENT DISPLAY TUBE FOR LARGE SCREEN VIDEO MATRIX ARRAY
Shuji Iwata; Tsutomu Suyama, both of Amagasaki; Nobuo Terazaki, Nagasaki; Shunichi Futatsuishi, Nagasaki; Zenichiro Hara, Nagasaki, and Noriyuki Tomimatsu, Nagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Continuation-in-part of Ser. No. 917,366, Oct. 9, 1986, abandoned, and a continuation-in-part of Ser. No. 917,367, Oct. 9, 1986, abandoned. This application Oct. 27, 1989, Ser. No. 428,046
Claims priority, application Japan, Apr. 18, 1986, 61-14571; Apr. 18, 1986, 61-14575
Term of patent 14 years
U.S. Cl. D26—1



317,658
TAILLAMP FOR AUTOMOBILE
Harumi Okano, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 8, 1989, Ser. No. 391,369
Claims priority, application Japan, Feb. 8, 1989, 1-14416
Term of patent 14 years
U.S. Cl. D26—28

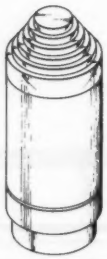


317,659
COMBINED BATTERY OPERATED LANTERN AND WATERPROOF CAP
Kenneth L. W. Hau, c/o Room 902, Chevalier House, 45-51 Chatham Rd., South, Tsimshatsui, Kowloon, Hong Kong
Filed Nov. 10, 1988, Ser. No. 269,654
Term of patent 14 years
U.S. Cl. D26—38

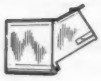


317,660
ADJUSTABLE LAMP
Sacha Ketoff, Ivry, France, assignor to PAF S.R.L., Italy
Filed Mar. 13, 1989, Ser. No. 322,237
Term of patent 14 years
U.S. Cl. D26—65

317,661
OUTDOOR BOLLARD LIGHTING FIXTURE
Hiroshi Kira, Westlake Village, Calif., assignor to Lumiere Design and Manufacturing, Inc., Westlake, Calif.
Filed Oct. 13, 1989, Ser. No. 421,393
Term of patent 14 years
U.S. Cl. D26—68

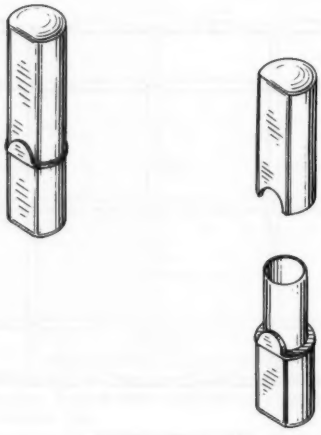


317,662
COMBINED FLASHLIGHT CASING HEAD AND REFLECTOR
Paul R. Bliss, Delta, Ohio, assignor to Fulton Industries, Inc., Wauseon, Ohio
Filed Oct. 4, 1989, Ser. No. 400,269
Term of patent 14 years
U.S. Cl. D26—113

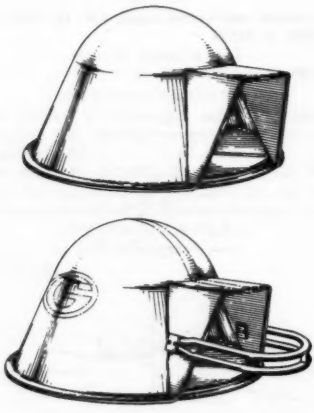


317,663
HAIR ORNAMENT
Julianne B. Calderon, 418 7th Ave., Salt Lake City, Utah 84103
Filed Aug. 17, 1989, Ser. No. 395,419
Term of patent 14 years
U.S. Cl. D28—41

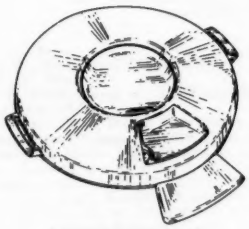
317,664
LIPSTICK CASE
Karena Bakic, Varese, Italy, assignor to Cosmede Anstalt, Vaduz, Liechtenstein
Filed Sep. 8, 1989, Ser. No. 404,435
Claims priority, application Int'l Pat. Institute, Apr. 5, 1989, DM/013279
Term of patent 14 years
U.S. Cl. D28—85



317,665
DOG HOUSE
Randolph L. Marshall, Columbus, Ga., assignor to Domation Inc., Columbus, Ga.
Filed Aug. 21, 1989, Ser. No. 396,612
Term of patent 14 years
U.S. Cl. D30—108



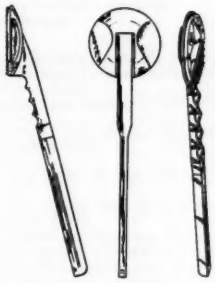
317,666
ANIMAL ACTIVATED FEEDER
Graham J. Haynes, P.O. Box 413, Plympton, Australia 5038
Filed Aug. 1, 1989, Ser. No. 388,705
Claims priority, application Australia, Feb. 2, 1989, 0282/89
Term of patent 14 years
U.S. Cl. D30—131



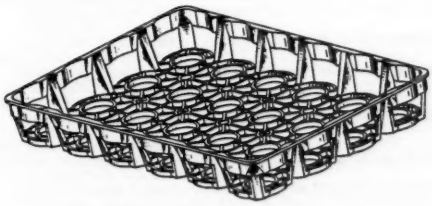
317,667
FLOOR TREATING MACHINE
Chester W. Bolser, Fremont, and Lyle H. Wierenga, Muskegon, both of Mich., assignors to Pacific Floor Machine Company, Inc., Grand Haven, Mich.
Filed May 17, 1988, Ser. No. 194,723
Term of patent 14 years
U.S. Cl. D32—19

317,668
FLOOR POLISHER MACHINE
Chester W. Bolser, Fremont, and Lyle H. Wierenga, Muskegon, both of Mich., assignors to Pacific Floor Machine Company, Inc., Grand Haven, Mich.
Filed May 17, 1988, Ser. No. 194,956
Term of patent 14 years
U.S. Cl. D32—19

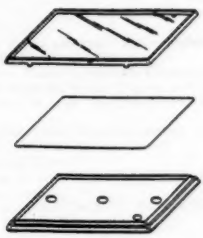
317,669
WINDSHIELD ICE SCRAPER
Michael J. Farmer, Sioux Falls, S. Dak., assignor to Luverne Truck Equipment Inc., Brandon, S. Dak.
Filed Sep. 18, 1989, Ser. No. 409,032
Term of patent 14 years
U.S. Cl. D32—49



317,670
NESTABLE CAN TRAY
William P. Apps, Anaheim, Calif., assignor to Rehrig-Pacific Company, Inc., Los Angeles, Calif.
Filed May 23, 1989, Ser. No. 357,068
Term of patent 14 years
U.S. Cl. D34—40



317,671
COIN TRAY AND THE LIKE
Charles L. Skaggs, Great Falls; Charles A. Thomas, Fairfax, and Sara L. Danis, McLean, all of Va., assignors to Mobil Oil Corporation, Fairfax, Va.
Filed Apr. 14, 1988, Ser. No. 183,026
Term of patent 14 years
U.S. Cl. D99—34



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 18TH DAY OF JUNE, 1991

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A.G.P. Systems, Inc.: *See*—
Leys, Cassius W., 5,024,780, Cl. 252-162.000.

A. H. Robins Co., Inc.: *See*—
Lo, Young S.; Walsh, David A.; and Uwaydah, Ibrahim M., 5,025,031, Cl. 514-399.000.

Abbott, Kenneth E.; and Lyons, Patrick J., to Stripping Technologies Inc. Abrasive media valve system. 5,024,029, Cl. 51-438.000.

Abdelrazik, Mohamed A.; Martin, John D.; and Corcoran, Boyd L., to E-Systems, Inc. Airborne antenna and a system for mechanically steering an airborne antenna. 5,025,262, Cl. 343-705.000.

Abe, Kunihiro, to Fuji Jukogyo Kabushiki Kaisha. Air-fuel ratio control system for automotive engine. 5,024,199, Cl. 123-489.000.

Abe, Kunihiro, to Fuji Jukogyo Kabushiki Kaisha. Analog-to-digital conversion system for an electronic control system of a motor vehicle. 5,025,259, Cl. 341-118.000.

Abe, Masaki: *See*—
Kuruma, Kiyoshi; Abe, Masaki; Kagechika, Hiroshi; and Kagaya, Shinichi, 5,024,900, Cl. 428-626.000.

Abe, Tsutomu; and Fukumoto, Masayuki, to Asahi Kasei Kabushiki Kaisha. Human monoclonal antibody to antigen of gastric cancer and B-cell line for producing this antibody, method for preparing this B-cell line and antibody, antigen and method of preparation of this antigen. 5,024,946, Cl. 435-240.270.

Abplanalp, Robert H.; and Naku, Virgil. Apparatus for forming an aerosol container closure. 5,024,592, Cl. 425-112.000.

Abumehdi, Cyrus: *See*—
Haines, John G.; Rosenbaum, Nolan G.; Pion, Albert L.; Lecarpentier, Marc; Henriot, Christophe; and Abumehdi, Cyrus, 5,025,383, Cl. 364-464.030.

Aburaya, Toshio: *See*—
Kokubo, Kouichi; Hamada, Toshiaki; Tagawa, Shinichi; Suzumura, Nobuyasu; Buma, Shuuichi; Aburaya, Toshio; Onuma, Toshio; Sato, Kunihito; Yonekawa, Takashi; Kawanishi, Masaki; Ikemoto, Hiroyuki; and Ohashi, Kaoru, 5,024,459, Cl. 280-707.000.

Abys, Joseph A.; and Straschil, Heinrich K., to AT&T Bell Laboratories. Palladium alloy electroplating process. 5,024,733, Cl. 204-3.000.

Academy of Applied Science: *See*—
Chien, James C. W., 5,024,894, Cl. 428-433.000.
Ramsay, Ronald, 5,024,428, Cl. 269-274.000.

Acker, William E.: *See*—
DePellegrini, Donald D.; Acker, William E.; and Hoff, Richard, 5,024,038, Cl. 52-700.000.

AcroMed Corporation: *See*—
Asher, Marc A.; Strippgen, Walter E.; Heinig, Charles F.; and Carson, William, 5,024,213, Cl. 128-69.000.

Adam, Yossef: *See*—
Landa, Benzion; Krumberg, Yakov; and Adam, Yossef, 5,025,290, Cl. 355-265.000.

Adams, Chip: *See*—
Pape, Robert; Rose, William; Burgel, Frank; and Adams, Chip, 5,023,996, Cl. 30-144.000.

Adams, Graham R.: *See*—
Pfaffmann, George D.; Kubis, Charles S.; Currie, John P.; Balzer, Norbert R.; Walter, John; and Adams, Graham R., 5,025,123, Cl. 219-10.750.

Adams, Thomas R.: *See*—
Collins, Glenn B.; Hildebrand, David F.; Lazzeri, Paul A.; Adams, Thomas R.; Parrott, Wayne A.; and Hartweck, Lynn M., 5,024,944, Cl. 435-172.300.

Adickes, Eric: *See*—
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Adiwinata, Sofyan. Rotary engine of the type having a planetary rotor with rotor and shaft equal rotation. 5,024,590, Cl. 418-61.200.

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Shapiro, Ronald S., 5,024,236, Cl. 128-735.000.

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Baror, Gigor, 5,025,366, Cl. 364-200.000.
Farmer, Charles, 5,025,181, Cl. 307-571.000.
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Advanced Nuclear Fuels Corporation: *See*—
Busch, Raymond A.; and Patterson, John F., 5,024,426, Cl. 267-158.000.

Advanced Products International, Inc.: *See*—
Masciarella, Andrew M.; and Whistler, George R., 5,023,998, Cl. 30-276.000.

AEC-Able Engineering Co., Inc.: *See*—
Harvey, Thomas J., 5,024,111, Cl. 73-865.600.

Aerospace Corporation, The: *See*—
Sheaffer, Patrick M.; and Noblet, James A., 5,024,710, Cl. 156-89.000.

Aerospatiale Societe Nationale Industrielle: *See*—
Debaig-Valade, Caroline; Filliatre, Claude; and Servens, Christian, 5,024,979, Cl. 501-95.000.
Lecourt, Guy; and Riou, Jacques, 5,024,712, Cl. 156-184.000.

Affa, Stephen N.: *See*—
McGilp, Kenneth J.; Affa, Stephen N.; and Newman, Ira R., 5,024,454, Cl. 277-207.00A.

Agfa-Gevaert AG: *See*—
Bauer, Walter; and Muller, Roland, 5,025,465, Cl. 378-169.000.

Agisim, Gary R.: *See*—
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Agren, Nils A., to SEM AB. Apparatus for controlling the trigger sequence in ignition systems. 5,025,498, Cl. 361-156.000.

Agro Forest Technik North America, Inc.: *See*—
Huber, Ernst, 5,024,172, Cl. 111-104.000.

Ahlborn, Gunter; Budenbender, Herbert; and Lohmann, Alfred, to Waggon Union GmbH. Bogie for rail vehicles. 5,024,166, Cl. 105-453.000.

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Lee, Ruojia; and Ahmad, Aftab A., 5,024,961, Cl. 437-34.000.

Ahmed, Hassan M., to Codex Corporation. Synchronizing continuous bit stream oriented terminals in a communications network. 5,025,457, Cl. 375-106.000.

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Air Preheater Company, Inc., The: *See*—
Mattison, Glenn D., 5,024,817, Cl. 422-111.000.

Air Products and Chemicals, Inc.: *See*—
Garg, Diwakar; Dyer, Paul N.; Schaffer, Leslie E.; Wreesics, Ernest L.; Dimos, Duane; and Mueller, Carl F., 5,024,901, Cl. 428-627.000.
Lucas, Peter A.; and Casey, Jeremiah P., 5,025,078, Cl. 528-120.000.

Aisin AW Co., Ltd.: *See*—
Sakakibara, Shiro; Hasebe, Masahiro; and Hattori, Masashi, 5,024,638, Cl. 475-210.000.

Aisin Kako Kabushiki Kaisha: *See*—
Yamaguchi, Shigeru; and Mizutani, Ken-ichiro, 5,024,267, Cl. 165-122.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Fujie, Naofumi; Imaizumi, Tomoaki; Ito, Koji; and Okada, Shoji, 5,025,187, Cl. 310-323.000.
Kokubo, Kouichi; Hamada, Toshiaki; Tagawa, Shinichi; Suzumura, Nobuyasu; Buma, Shuuichi; Aburaya, Toshio; Onuma, Toshio; Sato, Kunihito; Yonekawa, Takashi; Kawanishi, Masaki; Ikemoto, Hiroyuki; and Ohashi, Kaoru, 5,024,459, Cl. 280-707.000.
Nishii, Michiharu; Mizuno, Genji; Nomura, Yoshihisa; and Kato, Masahiko, 5,024,492, Cl. 303-114.000.
Nishikawa, Masumi, 5,024,157, Cl. 102-252.000.
Wakabayashi, Hideaki, 5,024,307, Cl. 192-40.000.
Yamaguchi, Shigeru; and Mizutani, Ken-ichiro, 5,024,267, Cl. 165-122.000.

Aitken, W. Sidney; and Gonzales, Ralph. Adjustable length piping union. 5,024,469, Cl. 285-302.000.

Ajax Magnethermic Corporation: *See*—
Howell, Charles N., 5,025,122, Cl. 219-10.710.

Akamine, Hiroshi: *See*—
Sato, Yoshinori; and Akamine, Hiroshi, 5,025,051, Cl. 524-99.000.

Akasaki, Yutaka; Aonuma, Hidekazu; Nukada, Katsumi; Tokita, Akihiko; Suto, Hidemi; Sato, Katsuhiro; and Tanaka, Hiroyuki, to Fuji Xerox Co., Ltd. Electrophotographic photoreceptor having an electric charge generating layer comprising a pyrylium compound. 5,024,911, Cl. 430-58.000.

Akiyama, Koichi, to Kowa Company Ltd. Ophthalmic measurement apparatus. 5,024,520, Cl. 351-221.000.

Aklonis, Carol A.; Ax, Helen A.; Kirsch, Donald R.; O'Sullivan, Joseph; Tymiak, Adrienne; and Wells, J. Scott, to E. R. Squibb & Sons, Inc. Dactylocycline A and dactylocycline B. 5,024,839, Cl. 424-115.000.

Ako, Hidenobu, to Teijin Seiki Company Limited. Servo control apparatus. 5,025,199, Cl. 318-561.000.

Aktiebolaget Electrolux: *See*—
Peterson, Christer C. I., 5,025,125, Cl. 219-85.110.

Aktiebolaget Hassle: *See*—
Brandstrom, Arne E.; Lindberg, Fer L.; and Sunden, Gunnel E., 5,025,024, Cl. 514-338.000.

AKZO NV: *See*—
Barda, Henry J., 5,025,090, Cl. 568-33.000.

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Alandale Industries, Inc.: *See*—
Gutschmit, Alan, 5,024,393, Cl. 242-131.000.

Alberghini, Alfred C.; Brunson, David A.; and Lynn, Stephen R., to Sewell Plastics, Inc. Wide stance footed bottle. 5,024,340, Cl. 215-1.00C.

Alcan Aluminum Corporation: *See*—
Gailey, J. Lynn, 5,024,034, Cl. 52-484.000.

Alcatel N.V.: *See*—
De Luca, Olivier, 5,025,234, Cl. 333-166.000.
Pauer, Dieter, 5,025,461, Cl. 375-119.000.

Alcatel Transmission par Faisceaux Hertziens: *See*—
Hurinville, Bertrand, 5,025,453, Cl. 375-10.000.

Alcon Surgical, Inc.: *See*—
Tyler, Hugh J., 5,024,654, Cl. 604-43.000.

Aldwin, Lois: *See*—
Houston, L. L.; Aldwin, Lois; and Nitecki, Danute E., 5,024,834, Cl. 424-85.910.

Alfa Lancia Industriale S.p.A.: *See*—
Petrelli, Luigi, 5,024,480, Cl. 296-146.000.

Alfa-Laval Separation AB: *See*—
Inge, Claes; Franzen, Peter; Lagerstedt, Torgny; Borgstrom, Leonard; Carlsson, Claes-Goran; Moberg, Hans; and Nåbo, Olle, 5,024,648, Cl. 494-56.000.

Alfred Teves GmbH: *See*—
Booten, Sigmund; Kley, Uwe; and Hoffmann, Cristiano, 5,024,304, Cl. 188-356.000.

Alfredeen, Lennart A. Electromagnetic device for heating metal elements. 5,025,124, Cl. 219-10.750.

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Linder, Charles; Perry, Mordechai; Nemas, Mara; and Katraro, Reuven, 5,024,765, Cl. 210-651.000.

Allaire, Roger A.; Friske, Mark S.; Hagg, Sandra L.; and Janas, Victor F., to Corning Incorporated. Compositions and methods for making ceramic matrix composites. 5,024,978, Cl. 501-95.000.

Allen, Frankie H.; and Leone, David A., to Siemens Energy & Automation, Inc. Circuit breaker contact assembly. 5,025,121, Cl. 200-275.000.

Allied-Signal Inc.: *See*—
Henk, Michael G.; and Summers, Jack C., II, 5,024,824, Cl. 423-213.500.
Logsdon, Peter B.; Stachura, Leonard M.; Swan, Ellen L.; and Basu, Bajat S., 5,024,781, Cl. 252-171.000.
Mason, Charles D.; Sacks, William; Engelmann, Theodore R.; and Verma, Satyajit, 5,024,897, Cl. 428-474.400.
Thomas, Rudy V., 5,023,980, Cl. 24-196.000.
Zupancic, Joseph J.; Swedo, Raymond J.; Jamieson, Donald R.; Schumacher, Elaine F.; and Buehler, Allyson J., 5,025,079, Cl. 528-170.000.

Alonso, Nelson A. Bidet accessory. 5,023,961, Cl. 4-448.000.

Alpha Industries: *See*—
Negas, Taki; and Dominques, Louis P., 5,024,980, Cl. 501-134.000.

Alsop, George M., to Union Carbide Chemicals and Plastics Technology Corporation. Method for obtaining analytes from liquid menstrua for analysis. 5,024,952, Cl. 436-177.000.

Altman, Leonard F.; Flaugher, Jill L.; Suppelsa, Anthony B.; and Mullen, William B., III, to Motorola, Inc. Method of making high density solder bumps and a substrate socket for high density solder bumps. 5,024,372, Cl. 228-248.000.

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Hittner, Herman J.; and Nguyen, Quyen C., 5,024,822, Cl. 423-111.000.

Alusuisse-Lonza Services Ltd.: *See*—
Ryan, Thomas J., 5,024,696, Cl. 75-708.000.

Alvarado-Swaisgood, Aileen E.: *See*—
Kaminsky, Mark P.; Kleefisch, Mark S.; Huff, George A.; Washecheck, Don M.; Alvarado-Swaisgood, Aileen E.; and Barr, Mark K., 5,024,984, Cl. 502-303.000.

ALZA Corporation: *See*—
Edgren, David E.; and Theeuwes, Felix, 5,024,842, Cl. 424-473.000.
Kuczynski, Anthony L.; Ayer, Atul D.; and Wong, Patrick S.-L., 5,024,843, Cl. 424-499.000.
Yum, Su Il, 5,024,663, Cl. 604-131.000.

Ambridge Limited: *See*—
Jerie, Hans G., 5,024,523, Cl. 353-11.000.

American Cyanamid Company: *See*—
Rothstein, David M.; Love, Susan F.; and Baum, Ellen Z., 5,024,948, Cl. 435-252.100.
Trybulski, Eugene J.; and Brabander, Herbert J., 5,025,099, Cl. 548-527.000

American Home Products Corporation: *See*—
Motola, Soiomon; Agisim, Gary R.; and Mogavero, Annabelle, 5,024,997, Cl. 514-58.000.

American Life Support Technology: *See*—
Ferrand, Robert, 5,023,967, Cl. 5-62.000.

American Materials Recycling Inc.: *See*—
Boyd, John A.; and Staples, George M., III, 5,024,770, Cl. 210-747.000.

American Photo Systems, Inc.: *See*—
Greene, Arnold H.; and Holden, Harold E., 5,024,512, Cl. 350-514.000.

American Saw & Mfg. Company: *See*—
Korb, William B., 5,024,026, Cl. 51-206.400.

American Standard Inc.: *See*—
Bergmann, Konrad; Ems, Josef; and Nikolayczik, Hans, 5,024,378, Cl. 236-93.00B.

American Sterilizer Company: *See*—
Saluja, Raja; and Nagare, Arthur T., 5,025,359, Cl. 362-402.000.

Ametek, Inc.: *See*—
Holler, Thomas D., 5,024,764, Cl. 210-484.000.

Amoco Corporation: *See*—
Kaminsky, Mark P.; Kleefisch, Mark S.; Huff, George A.; Washecheck, Don M.; Alvarado-Swaisgood, Aileen E.; and Barr, Mark K., 5,024,984, Cl. 502-303.000.

Amonett, Daniel K.: *See*—
Cole, Ronald E.; and Amonett, Daniel K., 5,025,117, Cl. 200-38.00R.

AMP Incorporated: *See*—
Bennett, Glenn E.; Lucius, John E.; Polk, Roger N.; Rider, Frederick H.; and Szczesny, David S., 5,024,627, Cl. 439-631.000.
Dola, Frank P.; Feldman, Steven; Lauterbach, John H.; and Mengelson, William G., 5,024,614, Cl. 439-114.000.
French, Jay L.; Himes, John L., Jr.; Weber, Ronald M.; and Wise, James H., 5,024,610, Cl. 439-857.000.
Hettinger, Arthur C., 5,024,106, Cl. 73-862.540.

Anahara, Meiji: *See*—
Yasui, Yoshiharu; Anahara, Meiji; Asahi, Goro; and Miyake, Shiro, 5,024,874, Cl. 428-257.000.

Analgesic Associates: *See*—
Sunshine, Abraham; Laska, Eugene M.; and Siegel, Carole E., 5,025,019, Cl. 514-277.000.

Anderheggen, Wolfgang; Kraemer, Michael; Vogelsgesang, Roland; Wagner, Wolfram; Olges, Wolfgang; and Dragovic, Thomas, to Bayer Aktiengesellschaft. Processes for the production of mono- and multifilaments and staple fibers based on polyarylene sulfides. 5,024,797, Cl. 264-143.000.

Andersen, Peter H.: *See*—
Gronwald, Frederik; Andersen, Peter H.; Faarup, Peter; Guddal, Erling; Hansen, Kristian T.; Hansen, Louis B.; and Nielsen, Erik B., 5,025,009, Cl. 514-213.000.

Anderson, David B. Computer software protection, by optical effects. 5,024,495, Cl. 350-3.700.

Anderson, Donald A., to Gear Fit Golf, Inc. Golf club head. 5,024,437, Cl. 273-78.000.

Anderson, Donald J.; Duerksen, John H.; McCallum, Doug J.; and Petrick, Mark, to Chevron Research Company. Method of recovering hydrocarbons using single well injection/production system. 5,024,275, Cl. 166-303.000.

Anderson, Eric W.: *See*—
Ford, Douglas L.; Anderson, Eric W.; and Kopp, Clinton V., 5,024,762, Cl. 210-321.690.

Anderson, Ray L. Prefabricated construction unit with insulation. 5,024,033, Cl. 52-407.000.

Anderson, Robert: *See*—
Romero, Hugo; and Anderson, Robert, 5,024,109, Cl. 73-864.160.

Anderson, Roger, to Robotic Originals, Inc. Lightweight gripper for robotic transfer operations. 5,024,575, Cl. 414-627.000.

Anderson, Stuart L.; and Sandstrom, Richard L., to Cymer Laser Technologies. System for, and method of, regulating the wavelength of a light beam. 5,025,445, Cl. 372-20.000.

Anderson, Thomas F. Latch hook frame. 5,024,357, Cl. 223-106.000.

Andra, Rainer H., to Carl Freudenberg, Firma. Torsional vibration damper with an undulating damping ring. 5,024,120, Cl. 74-574.000.

Andrew Corporation: *See*—
Sohner, Harold K.; Hoyloak, Joel N.; Girvin, Richard J.; and Kumar, Surinder, 5,025,452, Cl. 375-1.000.

Andrews, Mena G.: *See*—
Hatfield, Stephen C.; Andrews, Mena G.; and Broders, Richard P., 5,024,807, Cl. 376-352.000.

Ankrom, Michael J.: *See*—
Downs, Walter M.; and Ankrom, Michael J., 5,024,734, Cl. 204-15.000.

Anritsu Corporation: *See*—
Yamazaki, Syoji; Oda, Toshikazu; Iwanaga, Kenji; and Gono, Yoshitaka, 5,025,237, Cl. 335-83.000.

Anthony, Ella L.: *See*—
Harbarger, Josephine A.; Oliver, David; and Anthony, Ella L., 5,024,207, Cl. 125-35.000.

Anthony, James R.; Wiseman, Michael A.; and Lortz, Allan R., to Indiana Mills & Manufacturing, Inc. Belt buckle with interlocking dual tongue. 5,023,981, Cl. 24-573.500.

Anthony, Michael; Ohler, Craig A.; and Christensen, Arnold, to Anthony, Michael. Electronic tuner for a musical instrument. 5,024,132, Cl. 84-312.00R.

Aoike, Tatsuyuki: *See*—
Kanai, Masahiro; Aoike, Tatsuyuki; Matsuda, Koichi; and Kawakami, Soichiro, 5,024,706, Cl. 136-258.000.

Aoki, Shinichiro; Sato, Takeo; Yamaguchi, Katsumasa; and Yamamoto, Masaki, to Matsushita Electric Industrial Co., Ltd. Alignment apparatus including three beams and three gratings. 5,025,168, Cl. 250-548.000.

Aoki, Shinya: *See*—
Iida, Shinzi; Takeya, Fuminori; and Aoki, Shinya, 5,025,343, Cl. 360-127.000.

Aonuma, Hidekazu: *See*—
Akasaki, Yutaka; Aonuma, Hidekazu; Nukada, Katsumi; Tokita, Akihiko; Suto, Hidemi; Sato, Katsuhiro; and Tanaka, Hiroyuki, 5,024,911, Cl. 430-58.000.

Aoshima, Shinichiro; Urakami, Tsuneyuki; and Tsuchiya, Yutaka, to Hamamatsu Photonics Kabushiki Kaisha. Light waveform changing apparatus using an optical amplifier. 5,025,142, Cl. 250-201.900.

Aoyagi, Toshitaka; and Motoda, Takashi, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor laser device. 5,025,450, Cl. 372-46.000.

Appelt, Kathleen A.: *See*—
Hartke, David J.; and Appelt, Kathleen A., 5,024,188, Cl. 123-195.00A.

Appleton Specialty Products, Inc.: *See*—
Frawley, Thomas E., Jr., 5,024,084, Cl. 73-215.000.

Appleyard, Ian P.: *See*—
Jones, William J.; and Appleyard, Ian P., 5,024,827, Cl. 423-610.000.

Aquaria, Inc.: *See*—
Reinoehl, Robert F., 5,025,185, Cl. 310-87.000.

Arai, Kei; Ohashi, Minoru; Utsugi, Yoshio; Oka, Osamu; Numazawa, Kenichi; Miwa, Kenji; and Sugawara, Kenzo, to Zaidanhojin Shokuhin Sangyo Senta; and Oriental Electric Company, Ltd. Apparatus for determining the degree of freshness of raw, frozen and processed fish, poultry and meat. 5,024,816, Cl. 422-68.100.

Arai, Kunio, to Hitachi Seiko Ltd. Pressure foot for printed circuit board drilling machine. 5,024,562, Cl. 408-1.00R.

Arai, Osamu: *See*—
Sato, Isao; Kirikami, Seiichi; Shimura, Akira; Hirose, Fumiyuki; Inose, Hiroshi; Urushidani, Haruo; and Arai, Osamu, 5,024,055, Cl. 60-39.270.

Arakawa, Ikuo, to Mitsuba Electric Manufacturing Co., Ltd. Method for coating the armature of a rotary electric apparatus. 5,024,857, Cl. 427-104.000.

Arakawa, Masao; Terasawa, Tomizo; Ogawa, Masanobu; and Kami, Hironori, to Matsushita Electric Works, Ltd. Sensor in IC formation. 5,025,169, Cl. 250-574.000.

Araki, Kazunori: *See*—
Hagiwara, Hiroshi; Araki, Kazunori; and Michimori, Akihiro, 5,024,650, Cl. 600-26.000.

Araki, Shinji: *See*—
Oohashi, Keiji; Araki, Shinji; Suzuki, Hideo; and Shimomichi, Tsuyoshi, 5,024,688, Cl. 65-3.120.

Araki, Shunji: *See*—
Mouri, Hiroshi; and Araki, Shunji, 5,025,059, Cl. 524-495.000.

ARBO Medizin-Technologie GmbH: *See*—
Schmid, Walter, 5,024,227, Cl. 128-640.000.

ARCH Development Corp.: *See*—
Roizen, Michael; Turcotte, William E., II; and Pfisterer, Richard E., 5,025,374, Cl. 364-413.020.

Ardco, Inc.: *See*—
Kostos, Jeffery; Kaspar, Melvin; and Artwohl, Paul, 5,024,023, Cl. 49-501.000.

Argy, Gilles: *See*—
Busnel, Rene-Guy; and Argy, Gilles, 5,024,852, Cl. 427-2.000.

Arimoto, Akira; Saito, Susumu; Tsunoda, Yoshito; Moriyama, Shigeo; and Mochizuki, Takeshi, to Hitachi, Ltd.; and Hitachi Koki Co., Ltd. Optical scanning apparatus and asymmetrical aspheric scanning lens. 5,025,268, Cl. 346-108.000.

Armstrong, Gordon P.: *See*—
Pollet, Jean C.; Williams, Gary L.; Armstrong, Gordon P.; and Flautt, Martin C., 5,024,890, Cl. 428-372.000.

Armstrong, Mark L.: *See*—
Smothers, William K.; Doraiswamy, Krishna C.; and Armstrong, Mark L., 5,024,909, Cl. 430-1.000.

Armstrong World Industries Inc.: *See*—
Bowers, John H., 5,025,273, Cl. 346-159.000.

Arnould, Jacques, to Telemecanique. Cellular power semiconductor device. 5,025,299, Cl. 357-45.000.

Aron, M. Jerome, to Kuhn S.A. Agricultural machine having at least one rotor for moving products located on the ground. 5,024,053, Cl. 56-367.000.

Arthur, David J.; and Swei, Gwo S., to Rogers Corporation. Ceramic filled fluoropolymetric composite material. 5,024,871, Cl. 428-209.000.

Arthur Schlaginhaufen Ing.: *See*—
Schlaginhaufen, Arthur, 5,024,763, Cl. 210-333.010.

Artwohl, Paul: *See*—
Kostos, Jeffery; Kaspar, Melvin; and Artwohl, Paul, 5,024,023, Cl. 49-501.000.

Artz, John M., to Mitre Corporation, The. Datalink controller interface. 5,025,382, Cl. 364-439.000.

Asahi Glass Company, Ltd.: *See*—
Nakamura, Arao; Manabe, Tsuneo; Sugimoto, Naoki; and Usui, Hiroshi, 5,024,974, Cl. 501-57.000.

Asahi, Goro: *See*—
Yasui, Yoshiharu; Anahara, Meiji; Asahi, Goro; and Miyake, Shiro, 5,024,874, Cl. 428-257.000.

Asahi Kasei Kabushiki Kaisha: *See*—
Abe, Tsutomu; and Fukumoto, Masayuki, 5,024,946, Cl. 435-240.270.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Shimamura, Yasuki; and Ihata, Jyoji, 5,025,266, Cl. 346-1.100.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Kitazawa, Toshiyuki; Kurosaki, Masahiko; and Ohsawa, Yutaka, 5,025,276, Cl. 354-152.000.

Asai, Kohtaro: *See*—
Murakami, Tokumichi; Asai, Kohtaro; and Matsuzaki, Kazuhiro, 5,025,482, Cl. 382-56.000.

Asakawa, Kouji: *See*—
Miura, Masao; Uchida, Naoshi; Takahashi, Tatsunori; Asakawa, Kouji; and Nozawa, Eiji, 5,025,236, Cl. 335-46.000.

Asakura, Tsutou: *See*—
Takanashi, Itsuo; Nakagaki, Shintaro; Shinonaga, Hirohiko; Asakura, Tsutou; Furuya, Masato; and Tai, Hiromichi, 5,025,209, Cl. 324-96.000.

Asars, Juris A.: *See*—
Leksell, David; Kun, Zoltan K.; and Asars, Juris A., 5,025,321, Cl. 358-296.000.

Asato, Edward E.: *See*—
Stamness, Jesse I.; Morrow, Raymond W.; and Asato, Edward E., 5,025,327, Cl. 360-45.000.

Asea Brown Boveri Aktiengesellschaft: *See*—
Hahn, Walter; Lutz, Ferdinand; and Jahn, Manfred, 5,024,115, Cl. 74-89.150.

Asea Brown Boveri Ltd.: *See*—
Jetzer, Gregor; Kolb, Roland; and Spinnler, Fritz, 5,024,589, Cl. 418-55.300.

Ashby, Robert E., to Moore Business Forms, Inc. Flyless mailer having top sheet with cutout. 5,024,374, Cl. 229-71.000.

Ashdown, Charles P.; Bewley, James G.; and Kenney, George B., to UltraFine Powder Technology, Inc. Fine hollow particles of metals and metal alloys and their production. 5,024,695, Cl. 75-338.000.

Asher, Marc A.; Strippgen, Walter E.; Heinig, Charles F.; and Carson, William, to AcroMed Corporation. Connector for a corrective device. 5,024,213, Cl. 128-69.000.

Ashland Oil, Inc.: *See*—
Landers, Perry E.; and Felton, George F., 5,024,697, Cl. 106-14.130.

Asics Corporation: *See*—
Kiyosawa, Junichi, 5,024,006, Cl. 36-83.000.
Teranishi, Mitsuji; Watanabe, Yasuo; and Takeuchi, Akira, 5,025,384, Cl. 364-468.000.

Asoh, Syoichi, to Kabushiki Kaisha Toshiba. Semiconductor device for performing automatic replacement of defective cells. 5,025,418, Cl. 365-200.000.

Assh, Daniel. Combined air and leaf spring suspension for heavy weight vehicle. 5,024,462, Cl. 280-712.000.

Astra Meditec Aktiebocag: *See*—
Buchel, Udo P., 5,024,615, Cl. 604-119.000.

Astra-Vent AB: *See*—
Torok, Vilmos; and Loreth, Andrzej, 5,024,685, Cl. 55-117.000.

AT&T Bell Laboratories: *See*—
Abys, Joseph A.; and Straschil, Heinrich K., 5,024,733, Cl. 204-3.000.
Billig, James N.; Chlipala, James D.; Lee, Kuo H.; and Nagy, William J., 5,025,300, Cl. 357-51.000.
Bleich, Larry L.; Roberts, Joni A.; and Zerbs, Stephen T., 5,024,864, Cl. 427-424.000.
Burack, John J.; LeGrange, Jane D.; and Townsend, Wesley P., 5,024,873, Cl. 428-220.000.
Chen, Chin-Chen; Feldman, Martin; and Waggener, Herbert A., 5,025,165, Cl. 250-491.100.
Craft, Adam B.; and Torok, Gabor P., 5,025,211, Cl. 324-158.00R.
Dietrich, Norman R.; Moyer, Ralph S.; and Wong, Yiu-Huen, 5,024,966, Cl. 437-60.000.
Duttweiler, Donald L., 5,025,258, Cl. 341-107.000.
Earp, Ronald L., 5,025,423, Cl. 367-137.000.
Hardin, Tommy G.; and Khorramian, Behrooz A., 5,024,506, Cl. 350-96.230.
Jebens, Robert W., 5,024,497, Cl. 350-96.200.
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Sandler, Stanley R., 5,025,104, Cl. 562-109.000.

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Russell, Donald L., 5,024,297, Cl. 188-18.00A.
Baba, Fumiaki, to Mazda Motor Corporation. Shift control system for an automatic transmission. 5,024,125, Cl. 74-866.000.
Bachman, William H., to Combustion Engineering, Inc. Support grid with integral inclined waves. 5,024,810, Cl. 376-438.000.
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Thornborough, Raymond J.; and Strobel, Donald H., 5,025,470, Cl. 379-107.000.
Baer, William G. Animal training device. 5,024,183, Cl. 119-29.000.
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Bailey, Larry D. Band and label carrier. 5,024,337, Cl. 211-88.000.
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Bakowski, Steven J.: *See—*
Schumacher, David B.; and Bakowski, Steven J., 5,024,595, Cl. 431-18.000.
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Borner, Willy; and McQueeney, Kenneth A., 5,024,001, Cl. 33-203.180.
Baldwin, Brian E. Adjustably controllable accuracy-enhancing pump arrangement and method. 5,024,347, Cl. 222-1.000.
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Scott, Brian L.; Smith, Lloyd A.; Newell, J. Mark; Balentine, Bruce E.; and Lin, Lisan S., 5,025,471, Cl. 381-43.000.
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Ballard, Estus E. Pipe clamp for overhead sprinkler heads and the like. 5,024,404, Cl. 248-62.000.
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Barke, Otto. Pedestrian signal system for automobiles. 5,025,245, Cl. 340-471.000.
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Barr, Mark K.: *See—*
Kaminsky, Mark P.; Kleefisch, Mark S.; Huff, George A.; Washecheck, Don M.; Alvarado-Swaisgood, Aileen E.; and Barr, Mark K., 5,024,984, Cl. 502-303.000.
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Barrett, David D. Air conditioning system for confined spaces. 5,024,065, Cl. 62-285.000.
Barrie, Robert L. Flexible vane for arrows. 5,024,448, Cl. 273-423.000.
Barris, Marty A.; and Wagner, Wayne M., to Donaldson Company, Inc. Engine exhaust system with sequential loading of multiple filters. 5,024,054, Cl. 60-274.000.
Bartley, John E., to Waukesha Specialties & Fabricators. Adjustable support for loudspeaker. 5,024,407, Cl. 248-164.000.
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Dallum, Barry J.; and Bartlow, David H., 5,024,342, Cl. 220-468.000.
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Crema, Stefano C.; Kucera, Clare H.; Konrad, Gerd; and Hartmann, Heinrich, 5,025,040, Cl. 523-130.000.
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Ley, Gregor; Schultze, Wolfgang; Vinke, Johannes; and Wistuba, Eckehardt, 5,025,062, Cl. 524-556.000.
Oftring, Alfred; Birnbach, Stefan; Fikentscher, Rolf; Baur, Richard; Kud, Alexander; Goeckel, Ulrich; and Perner, Johannes, 5,025,103, Cl. 560-170.000.
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Thurman, Laurance R.; Dowd, Joseph P.; and Fischer, Kathy J., 5,024,772, Cl. 252-1.000.
Yeh, Ling; and Harrelson, Hugh G., Jr., 5,024,869, Cl. 428-97.000.
BASF K&F Corporation: *See—*
Christenson, Philip A.; Eilerman, Robert G.; Riker, Paul J.; and Drake, Brian J., 5,024,847, Cl. 426-535.000.
Basu, Bajat S.: *See—*
Logsdon, Peter B.; Stachura, Leonard M.; Swan, Ellen L.; and Basu, Bajat S., 5,024,781, Cl. 252-171.000.
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Miller, Steven D.; McDonald, Joseph C.; Eichner, Fred N.; and Tomeraasen, Paul L., 5,025,159, Cl. 250-337.000.
Timmerman, Craig L., 5,024,556, Cl. 405-128.000.
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Bauer, Walter; and Muller, Roland, to Agfa-Gevaert AG. X-ray cassette for foils with phosphor layer. 5,025,465, Cl. 378-169.000.
Baum, Ellen Z.: *See—*
Rothstein, David M.; Love, Susan F.; and Baum, Ellen Z., 5,024,948, Cl. 435-252.100.
Bauman, Ralph E.; and Seymour, Horace W., III, to Sanders Associates, Inc. Electrical circuit board mounting method. 5,024,623, Cl. 439-876.000.
Baur, Richard: *See—*
Oftring, Alfred; Birnbach, Stefan; Fikentscher, Rolf; Baur, Richard; Kud, Alexander; Goeckel, Ulrich; and Perner, Johannes, 5,025,103, Cl. 560-170.000.
Baureis, Hans-Paul: *See—*
Matucha, Karl-Heinz; Steffens, Thomas; Baureis, Hans-Paul; Bickle, Wolfgang; and Braus, Jurgen, 5,024,881, Cl. 428-323.000.
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Baxter International Inc.: *See—*
Mitchell, Richard J., 5,024,664, Cl. 604-143.000.
Needham, Thomas E.; Wright, Jeremy C.; Pearson, Steve; Chilamkurti, Rao; and Kopp, Clinton V., 5,024,657, Cl. 604-85.000.
Peterson, Robert H.; and McGurk-Burleson, Erin, 5,024,669, Cl. 623-13.000.
Soubrier, Pierre; and Denis, Xavier, 5,024,645, Cl. 493-380.000.
Tu, Roger; Chen, David; and Mathewson, Wilfred F., 5,024,671, Cl. 623-1.000.

Bayer Aktiengesellschaft: *See—*
Anderheggen, Wolfgang; Kraemer, Michael; Vogelsgesang, Roland; Wagner, Wolfram; Olges, Wolfgang; and Dragovic, Thomas, 5,024,797, Cl. 264-143.000.
Klug, Gunter; Jabs, Gert; Berneth, Horst; and Botta, Artur, 5,024,987, Cl. 503-211.000.
Lantzsch, Reinhard; Kysela, Ernst; Buchel, Karl H.; Dutzmann, Stefan; Brandes, Wilhelm; and Hanssler, Gerd, 5,025,030, Cl. 514-383.000.
Neuhaus, Alfred; Ganster, Otto; and Kopp, Richard, 5,025,039, Cl. 521-51.000.
Reiff, Helmut; and Lorenz, Otto, 5,025,064, Cl. 524-591.000.
Schallner, Otto; Negele, Michael; Santel, Hans-Joachim; Lurssen, Klaus; Schmidt, Robert R.; and Krauskopf, Birgit, 5,024,694, Cl. 71-95.000.
Tacke, Peter; Grigo, Ulrich; Nouvertne, Werner; Freitag, Dieter; Idel, Karsten-Josef; and Westeppe, Uwe, 5,025,065, Cl. 524-611.000.

Bayer, George: *See—*
Smith, Tempel, Jr.; Miletic, Veselko; Bayer, George; Coutre, Christopher A.; Reichel, William L.; and Chronowski, Mirek J., 5,025,223, Cl. 324-662.000.

Beauverd, Jean: *See—*
Baillemont, Ghislaine; and Beauverd, Jean, 5,024,552, Cl. 404-31.000.

Beaver, Phillip R., to Ethyl Corporation. Alcohol reaction media for production of hexabromocyclododecane. 5,025,110, Cl. 570-206.000.

Beckemeyer, Lynn M.: *See—*
Beckemeyer, Steven D.; and Beckemeyer, Lynn M., 5,024,515, Cl. 351-52.000.

Beckemeyer, Steven D.; and Beckemeyer, Lynn M. Ornaments for eye glasses. 5,024,515, Cl. 351-52.000.

Becker, Johann A.; Deusser, Peter G.; and Holzmann, Olar W. R., to U.S. Philips Corp. Switch box for producing freely selectable optical plug connections. 5,024,498, Cl. 350-96.100.

Beckman Instruments, Inc.: *See—*
Dodson, Charles L., 5,025,161, Cl. 250-364.000.
Lewis, Mark L.; Sharples, Thomas D.; and Little, Stephen E., 5,024,646, Cl. 494-16.000.

Begley, Carl L.: *See—*
Oldham, James G.; Spencer, Charles R.; Begley, Carl L.; and Meyer, H. Robert, 5,025,150, Cl. 250-253.000.

Behling, Rudolf: *See—*
Baitz, Guenter; and Behling, Rudolf, 5,025,477, Cl. 382-8.000.

Beiling Stone Group Co.: *See—*
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Bell, Joseph. Battery terminal post clamp. 5,024,620, Cl. 439-759.000.

Bell, Karen: *See—*
Sikand, Parminder S.; McAllister, Mary J.; Henel, John; Jackson, Allen L.; and Bell, Karen, 5,025,468, Cl. 379-67.000.

Bellagamba, Miro D. Athletic swing practice apparatus. 5,024,443, Cl. 273-188.00R.

Bellows, James C.; and Koubek, Rudolph, III, to Westinghouse Electric Corp. Steam turbine rotor having graded weldments. 5,024,582, Cl. 416-213.00R.

Beloit Corporation: *See—*
Gero, William; and Paskowski, Frank, 5,023,986, Cl. 29-163.600.

Bender, Walter W., to Blount, Inc. Multi-station cartridge reloading press with controlled powder dispensing. 5,024,135, Cl. 86-31.000.

Bennett, Glenn E.; Lucius, John E.; Polk, Roger N.; Rider, Frederick H.; and Szczesny, David S., to AMP Incorporated. Float mounted receptacle contact assembly for card cage. 5,024,627, Cl. 439-631.000.

Bennett, Robert B.; Hung, Vincent; and Sassoon, Ezra. Fastener for garments. 5,023,979, Cl. 24-68.00R.

Benneyworth, Douglas F.; and Baker, Richard J., to Koch Materials Company. Bridge joint construction. 5,024,554, Cl. 404-74.000.

Bensoussan, David; and Tardio, Don. Means for refreshing a triac control circuit power supply. 5,025,134, Cl. 219-494.000.

Berchtold, Klaus: *See—*
Colquhoun, Alexander; and Berchtold, Klaus, 5,025,260, Cl. 342-127.000.

Berg, Joseph A.; and Eames, Loren W. Front and back adjustable rocking seat support arrangement for seat having relatively adjustable sections. 5,024,485, Cl. 297-312.000.

Berger, Alexander, to Vernitron Corporation. Segmented resolver. 5,025,201, Cl. 318-605.000.

Berger, Harvey J.; Maddahi, Jamshid; and Berman, Daniel, to Centocor, Inc., by said Harvey J. Berger. Method of imaging coronary thrombi. 5,024,829, Cl. 424-1.100.

Bergeron, Real, to Microthermo. Automatic temperature monitoring system. 5,025,248, Cl. 340-596.000.

Bergmann, Konrad; Ems, Josef; and Nikolayczik, Hans, to American Standard Inc. Shut-off valve for scald prevention. 5,024,378, Cl. 236-93.00B.

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Gustafsson, Gert-Ove; Berntsson, Leif; and Larsson, Kåre, 5,024,703, Cl. 106-649.000.

Berry, John P., to Ethicon, Inc.; and University of Liverpool, The. Method and apparatus for manufacturing electrostatically spun structure. 5,024,789, Cl. 264-6.000.

Bertus, Brent J.: *See—*
Sughrue, Edward L., II; Tooley, Patricia A.; Bertus, Brent J.; and Grayson, Bille S., 5,024,750, Cl. 208-57.000.

Bethe, Klaus W. B., to U.S. Philips Corporation. Pressure or force sensor having an axially symmetrical pressure or force-receiving circular plate spring. 5,024,107, Cl. 73-862.650.

Bethlehem Steel Corporation: *See—*
Newman, H. Anthony, 5,024,380, Cl. 238-218.000.

Bettcher Industries, Inc.: *See—*
Bettcher, Laurence A., 5,023,953, Cl. 2-126.000.

Bettcher, Laurence A., to Bettcher Industries, Inc. Garment and protective sleeve. 5,023,953, Cl. 2-126.000.

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Merrell, Gene A., 5,024,768, Cl. 210-712.000.

Beuchel, Peter H., to Westinghouse Electric Corp. Punch for use in a pellet press. 5,024,559, Cl. 425-406.000.

Bewley, James G.: *See—*
Ashdown, Charles P.; Bewley, James G.; and Kenney, George B., 5,024,695, Cl. 75-338.000.

Bhagwat, Shripad S.; Main, Alan J.; and Rodriguez, Herman R., to Ciba-Geigy Corporation. (Arylsulfonamido- and pyridyl-)-substituted carboxylic acids and derivatives thereof and use for suppressing thromboxane activity. 5,025,025, Cl. 514-340.000.

Bice, Charles D., to Westinghouse Electric Corp. Reactor coolant pump having thermally stabilized hydrostatic sealing assembly. 5,024,452, Cl. 277-81.00R.

Bickle, Wolfgang: *See—*
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Billeter, Lynn S.: *See—*
Carlston, Jerry B., 5,024,403, Cl. 248-57.000.

Billig, James N.; Chlipala, James D.; Lee, Kuo H.; and Nagy, William J., to AT&T Bell Laboratories. Integrated circuits having improved fusible links. 5,025,300, Cl. 357-51.000.

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Mehrotra, Pankaj K.; and Billman, Elizabeth R., 5,024,976, Cl. 501-89.000.

Bingham, John A. C. Method and apparatus for reducing the turnaround time in facsimile transmission. 5,025,469, Cl. 379-98.000.

Bio Medic Data Systems, Inc.: *See—*
Campbell, Neil E.; and Park, Chinsoo, 5,024,727, Cl. 156-663.000.

Biolandes: *See—*
Coutiere, Dominique, 5,024,820, Cl. 422-261.000.

Biospace Instruments: *See—*
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Maine, Gregory T.; Daves, Robert S.; and Yocum, Robert R., 5,024,941, Cl. 435-69.900.

BioTrol, Inc.: *See—*
Hegeman, George D.; and Nickens, David G., 5,024,949, Cl. 435-262.000.

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Smith, Clement V., 5,024,649, Cl. 494-85.000.

Birken, Karl: *See—*
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Birker, Otto, to Lignoform Benken AG. Sound absorbing panel for interior walls. 5,024,290, Cl. 181-293.000.

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Lamb, William E.; Kowaleski, Jerome L.; Haikl, Vojtech; Bittancourt, Alan R.; and Daugherty, Harvey S., 5,025,280, Cl. 354-299.000.

Bitton, Max D.; and Wahlquist, Randall W., to Westinghouse Electric Corp. Deburring method and machine. 5,023,984, Cl. 29-81.050.

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Morehouse, James H.; Furay, David M.; Blagaila, John; Dion, F. Eugene; Shelstad, Scott A.; and Woods, Jimmy L., 5,025,336, Cl. 360-97.020.

Blakely, Lawrence W.; Howe, Michael A.; Pinholster, Daniel F., Jr.; Terry, Claude E.; and McIntosh, Robert H., Sr., to Interface, Inc. Antimicrobial carpet and carpet tile. 5,024,840, Cl. 424-404.000.

Blakeney, Andrew J.; Jeffries, Alfred T., III; and Sarubbi, Thomas R., to OCG Microelectronic Materials, Inc. Thermally stable light-sensitive compositions with o-quinone diazide and phenolic resin used in a method of forming a positive photoresist image. 5,024,921, Cl. 430-326.000.

Blaushild, Ronald M., to Westinghouse Electric Corp. Swinging support for nuclear power plant pressurizer valves. 5,024,804, Cl. 376-285.000.

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Miller, Phillip E.; Katz, Leonoard R.; Nath, Raymond J.; Blaushild, Ronald M.; Tatch, Michael D.; Kordalski, Frank J.; Wykstra, Donald T.; and Kavalkovich, William M., 5,025,129, Cl. 219-201.000.

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Blessing, Martin G., to Dana Corporation. Hydraulic variable lock differential with oil return in floating manifold. 5,024,634, Cl. 475-86.000.

Bloom, Iris B. K.: *See*—
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Blount, Inc.: *See*—
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Blount, William W., Jr.; and Zoeller, Joseph R., to Eastman Kodak Company. Novel trifunctional monomer compounds, polyesters derived therefrom and thermosetting coating compositions containing the polyesters. 5,025,086, Cl. 528-272.000.

Blumberg, Shlomo; and Olti, Avraham, to Y. M. Shoval Ltd. Reminder apparatus. 5,025,426, Cl. 368-10.000.

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Linner, John G., 5,024,830, Cl. 424-3.000.

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Holmgreen, W. Corbett; and Bunegin, Leonid, 5,024,220, Cl. 128-207.180.
Lee, Ming-Sheng, 5,024,934, Cl. 435-6.000.

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Gilbreath, John R.; and Gilbreath, Bobbie L., 5,024,292, Cl. 182-90.000.

Bobsein, Rex L.; Stone, Mark L.; and Geibel, Jon F., to Phillips Petroleum Company. Reinforced plastic comprising poly(arylene sulfide sulfone) polymer containing ether groups matrix. 5,024,876, Cl. 428-272.000.

Bock, Erich, to DIEHL GmbH & Co. Equipment for gun loader. 5,024,136, Cl. 89-6.000.

Bodor, Nicholas S., to University of Florida. Pharmaceutical formulations for parenteral use. 5,024,998, Cl. 514-58.000.

Boehringer Mannheim GmbH: *See*—
Mayr, Ulrich; Gauhl, Helmgard; and Seidel, Hans, 5,024,945, Cl. 435-191.000.
Reinholz. Erhard; Friebe, Walter-Gunar; Kampe, Wolfgang; Mertin, Jurgen; and Wilhelms, Otto-Henning, 5,025,028, Cl. 514-381.000.

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Falk, R. A., 5,024,499, Cl. 350-96.110.
Frank, Ed, 5,024,862, Cl. 427-264.000.
Pease, George E., Jr.; Romero, Ervin G.; and Glasenapp, Rudi K. H., 5,024,491, Cl. 303-93.000.
Riedinger, Thomas R.; and White, Thomas H., 5,024,398, Cl. 244-118.500.
Wuepper, Karl J.; Swanson, Jerald L.; and Hartz, Dale E., 5,023,987, Cl. 29-402.110.

Boelter, John D., Jr. Method of playing a board game. 5,024,445, Cl. 273-256.000.

Bogner, Martin, to GEZE Sport International GmbH. Safety ski binding. 5,024,457, Cl. 280-632.000.

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Boisseau, Jean-Louis, to Vega Automation. Programmable dynamically adjustable plunger and tray former apparatus. 5,024,641, Cl. 493-171.000.

Bolan, Michael L., to Dallas Semiconductor Corporation. Hand-held wand for reading electronic tokens. 5,025,141, Cl. 235-472.000.

Bolton, Bernard. Suture extender and needle guard. 5,024,323, Cl. 206-63.300.

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Haenni, Edwin W.; and Bolz, Hans-Peter, 5,024,349, Cl. 221-46.000.

Bonnaudet, Serge: *See*—
Cameron, Charles; Mimoun, Hubert; Robine, Alain; Bonnaudet, Serge; Chaumette, Patrick; and Dang Vu, Quang, 5,025,108, Cl. 585-500.000.

Bonnet, Ludwig; and Wetterauer, Ulrich, to Richard Wolf GmbH. Endoscope/resectoscope and shield therefor. 5,024,212, Cl. 128-4.000.

Bontrager, Rick L., to Great Western Foam Products Corporation. Foam packing frame and blank for forming the same. 5,024,328, Cl. 206-453.000.

Booten, Sigmund; Kley, Uwe; and Hoffmann, Cristiano, to Alfred Teves GmbH. Vacuum brake force booster with acoustic insulation. 5,024,304, Cl. 188-356.000.

Borchardt, John K., to Shell Oil Company. Hydraulic fracturing in subterranean formations. 5,024,276, Cl. 166-308.000.

Bordini, Giorgio; and Vincenzi, Maurizio, to Tetra Dev-Co. Pump unit with adjustable piston stroke length. 5,024,584, Cl. 417-342.000.

Borgstrom, Leonard: *See*—
Inge, Claes; Franzen, Peter; Lagerstedt, Torgny; Borgstrom, Leonard; Carlsson, Claes-Goran; Moberg, Hans; and Nåbo, Olle, 5,024,648, Cl. 494-56.000.

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Smith, Kim R.; and Borland, James E., 5,024,777, Cl. 252-117.000.

Borner, Willy; and McQueeney, Kenneth A., to Balco, Incorporated. Wheel alignment rim clamp claw. 5,024,001, Cl. 33-203.180.

Borowski, Richard, to Garlock Inc. Multi-position labyrinth seal ring. 5,024,451, Cl. 277-53.000.

Borowy, William J. Process to refine flyash captured from pulverized coal fired boilers and auxiliary equipment. 5,024,169, Cl. 110-165.00A.

Boss, Ernst; Dill, Andreas R.; and Zimmermann, Heinz, to Zevatech AG. Feeding apparatus for feeding belted components to an automatic assembly apparatus. 5,024,720, Cl. 156-584.000.

Bostick, John. Well sealing device. 5,024,270, Cl. 166-63.000.

Botich, Michael J.: *See*—
Winter, Steven D.; Botich, Michael J.; and Adickes, Eric, 5,024,177, Cl. 114-61.000.

Botsolas, Carol: *See*—
Botsolas, Christos J., 5,024,249, Cl. 138-110.000.

Botsolas, Christos J., to Botsolas, Carol. Specialized one-piece pipefitting cover for insulated strainer and lateral 45 degree -Y. 5,024,249, Cl. 138-110.000.

Botta, Artur: *See*—
Klug, Gunter; Jabs, Gert; Berneth, Horst; and Botta, Artur, 5,024,987, Cl. 503-211.000.

Bottomley, Ian E.; and Cooper, Graham A., to British Aerospace. Stopping-off method for use with diffusion bonding. 5,024,368, Cl. 228-118.000.

Bouchard, Andre C.; Thibault, Paul A.; Lagushenko Radomir; Maya, Jakob; and Maya, Jakob, to GTE Products Corporation. Glow discharge lamp. 5,025,190, Cl. 313-619.000.

Boudreau, Robert A.; and Rideout, William C., to GTE Laboratories Incorporated. Method of aligning and packaging an optoelectronic component with a single-mode optical fiber array. 5,024,504, Cl. 350-96.180.

Bouillot, Jean-Michel; Coutureau, Thierry; and Decuyper, Patrick G., to Orega Electronique et Mecanique. Transformer of ferrite closed magnetic circuit type. 5,025,241, Cl. 336-100.000.

Bourque, Donald L., to Dennison Manufacturing Company. Apparatus for dispensing fasteners. 5,024,365, Cl. 227-67.000.

Bousquet, Philippe; and Lehureau, Jean-Claude, to Thomson-Csf. Thermo-magnetic recording head. 5,025,341, Cl. 360-120.000.

Bova, Frank J.; Fitzgerald, Lawrence T.; and Mauderli, Walter, to University of Florida. Radiation teletherapy imaging system having plural ionization chambers. 5,025,376, Cl. 364-413.260.

Bowar, Ronald C.: *See*—
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Bowers, John H., to Armstrong World Industries Inc. RF drive circuit for an ion projection printing head. 5,025,273, Cl. 346-159.000.

Boyd, John A.; and Staples, George M., III, to American Materials Recycling Inc. Waste separating, processing and recycling system. 5,024,770, Cl. 210-747.000.

BP Chemicals Limited: *See*—
Bullen, David J., 5,025,071, Cl. 525-326.500.
Hazel, Nicholas J., 5,025,111, Cl. 585-601.000.

Brabander, Herbert J.: *See*—
Trybulski, Eugene J.; and Brabander, Herbert J., 5,025,099, Cl. 548-527.000.

Braden, Jeffrey S., to Olin Corporation. Multi-layer lead frames for integrated circuit packages. 5,025,114, Cl. 174-52.400.

Bragg, R. D.; and Weatherbee, H. Lloyd, to Doug Bragg Enterprises Ltd. Apparatus for harvesting berries on low plants. 5,024,052, Cl. 56-330.000.

Brandes, Wilhelm: *See*—
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Brandstrom, Arne E.; Lindberg, Fer L.; and Sunden, Gunnel E., to Aktiebolaget Hassle. Therapeutically active fluoro-substituted compound. 5,025,024, Cl. 514-338.000.

Brassey, J. Michael: *See*—
Turk, Amos, 5,024,682, Cl. 55-73.000.

Brattan, Keith, to Imperial Chemical Industries PLC. Structure for effecting gas-liquid and part thereof. 5,024,788, Cl. 261-114.100.

Braus, Jurgen: *See*—
Matucha, Karl-Heinz; Steffens, Thomas; Baureis, Hans-Paul; Bickle, Wolfgang; and Braus, Jurgen, 5,024,881, Cl. 428-323.000.
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Breed, Anthonius J. M.: *See*—
Drent, Eit; and Breed, Anthonius J. M., 5,025,092, Cl. 528-392.000.

Brelan, S.A.: *See*—
Leurent, Henri G., 5,024,040, Cl. 52-738.000.

Brendel, Berhard; and Schrors, Gunter. Process for reducing vibrations of successive sets of rolls and a roll arrangement having reduced vibratory tendencies. 5,024,150, Cl. 100-35.000.

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lege. Nucleic acids encoding the delta chain of the T cell antigen receptor. 5,024,940, Cl. 435-69.100.

Brewer, Terry: *See—*
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Breyer, Karl-Hermann, to Carl-Zeiss-Stiftung, Heidenheim/Brenz. Work-contacting probe system for a coordinate-measuring instrument. 5,024,003, Cl. 33-561.000.

Bridgestone Corporation: *See—*
Mouri, Hiroshi; and Araki, Shunji, 5,025,059, Cl. 524-495.000.
Yamagishi, Hisashi; Kakiuchi, Shinichi; and Tomita, Seisuke, 5,024,444, Cl. 273-232.000.

Briggs & Stratton Corporation: *See—*
Dykstra, Richard A., 5,024,204, Cl. 123-602.000.

Brigham and Women's Hospital: *See—*
Loscalzo, Joseph; and Cooke, John, 5,025,001, Cl. 514-91.000.

Brighton, Jeffrey E., to Texas Instruments Incorporated. Product of pillar alignment and formation process. 5,025,303, Cl. 357-68.000.

Brink, Andre; Cahill, Michael J.; Dawson, John; Gardner, Juilian W.; and Thierry, Alan A., to Molins PLC. Cigarette segregating apparatus. 5,024,333, Cl. 209-535.000.

Brinkman, Kerry C.: *See—*
Wang, Sophia L.; Meyer, George R.; and Brinkman, Kerry C., 5,024,677, Cl. 44-335.000.

Bristol-Myers Company: *See—*
Konishi, Masataka; Tomita, Koji; Oka, Masahisa; and Numata, Ken-ichi, 5,025,023, Cl. 514-183.000.

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British Aerospace Public Limited Company: *See—*
Harrison, Andrew B., 5,024,527, Cl. 356-124.000.

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Stanley, Ian W.; Shepherd, John N.; and Dobson, Peter S., 5,024,500, Cl. 350-96.150.

Britton, William E., Jr., to Ink Company, The. Thixotropic printing ink compositions and methods of preparing same. 5,024,700, Cl. 106-32.000.

Broders, Richard P.: *See—*
Hatfield, Stephen C.; Andrews, Mena G.; and Broders, Richard P., 5,024,807, Cl. 376-352.000.

Broer, Dirk J.; and Van Der Veen, Jan, to U.S. Philips Corporation. Method of manufacturing a polarization filter and a polarization filter so obtained. 5,024,850, Cl. 428-1.000.

Bromine Compounds Ltd.: *See—*
Effenberger, Reinhard; and Direktor, David, 5,025,002, Cl. 514-112.000.

Brooks, Peter E., to International Business Machines Corporation. Recirculating air filter system for rotating disk drives. 5,025,337, Cl. 360-97.030.

Brother Kogyo Kabushiki Kaisha: *See—*
Nakata, Takashi; Tomizawa, Takashi; Hayashi, Shigeyuki; Ohno, Motoshi; and Horaguchi, Yoichi, 5,025,281, Cl. 355-27.000.
Ohashi, Tsuyoshi, 5,025,447, Cl. 372-31.000.
Yamane, Mitsuo, 5,024,887, Cl. 428-335.000.
Yoshimoto, Satoshi; and Funamoto, Masaya, 5,024,545, Cl. 400-696.000.

Brotz, Gregory R. Wear-prevention structure for pneumatic conveying pipe elbow. 5,024,466, Cl. 285-16.000.

Brown, Kathleen L. Adjustable scalp protection for hair discoloration. 5,024,244, Cl. 132-270.000.

Brown, Thomas H. Lighted grab handles for trucks. 5,025,352, Cl. 362-83.300.

Brown & Williamson Tobacco Corporation: *See—*
Lowe, Byron L.; Lewis, Robert T.; Milliner, Kenneth M.; and Finn, Everett N., 5,024,351, Cl. 221-277.000.

Bruce, Martin G. Underwater propulsion device. 5,024,178, Cl. 114-315.000.

Brunelle, Louise: *See—*
Girardin, Guy; Morin, Pierre; Nguyen, Duy; Nguyen, Duc; and Brunelle, Louise, 5,024,151, Cl. 100-53.000.

Brunet, Michel: *See—*
Jouillat, Claude; and Brunet, Michel, 5,024,355, Cl. 222-162.000.

Brunson, David A.: *See—*
Alberghini, Alfred C.; Brunson, David A.; and Lynn, Stephen R., 5,024,340, Cl. 215-1.00C.

Bryant, Robert G.; Hornak, Joseph P.; and Marshall, Eric A., to University of Rochester, The. Resonators for magnetic resonance imaging. 5,024,229, Cl. 128-653.0SC.

Bryngelson, Gaylord D. Automotive sun screen. 5,024,479, Cl. 296-97.700.

Bubel, Rainer: *See—*
Holland-Letz, Horst; and Bubel, Rainer, 5,024,126, Cl. 81-489.000.

Buchacz, Jurek. Adjustable sitting device. 5,024,484, Cl. 297-300.000.

Buchbauer, Burkhart, to D. Swarovski & Co. Method of applying ornamental element with a shaft of melt adhesive. 5,024,713, Cl. 156-221.000.

Buchel, Karl H.: *See—*
Lantzsch, Reinhard; Kysela, Ernst; Buchel, Karl H.; Dutzmann, Stefan; Brandes, Wilhelm; and Hanssler, Gerd, 5,025,030, Cl. 514-383.000.

Buchel, Udo P., to Astra Meditec Aktiebocag. Surgical aspiration device. 5,024,615, Cl. 604-119.000.

Bucher, George D.: *See—*
Wilson, John F.; Rosal, Enrique R.; and Bucher, George D., 5,024,574, Cl. 414-416.000.

Buchholz, Robert L.; Grald, Eric W.; Nelson, Lorne W.; and Shah, Dipak J., to Honeywell Inc. Zone control system providing synchronization of system operation with the zone of greatest demand. 5,024,265, Cl. 165-22.000.

Buchman, James E.; and Jahnke, Kenneth C., to Presto Products, Incorporated. Rotary draw tape bag making apparatus and method. 5,024,642, Cl. 493-193.000.

Buckley, Paul W.: *See—*
Fontana, Luca P.; and Buckley, Paul W., 5,025,081, Cl. 528-176.000.

Budenbender, Herbert: *See—*
Ahlborn, Gunter; Budenbender, Herbert; and Lohmann, Alfred, 5,024,166, Cl. 105-453.000.

Buehler, Allyson J.: *See—*
Zupancic, Joseph J.; Swedo, Raymond J.; Jamieson, Donald R.; Schumacher, Elaine F.; and Buehler, Allyson J., 5,025,079, Cl. 528-170.000.

Bugrov, Vladimir P.: *See—*
Kozlov, Vladimir S.; Markov, Gennady I.; and Bugrov, Vladimir P., 5,024,658, Cl. 604-96.000.

Buhl, Horst; Holz, Josef; and Dany, Franz-Josef, to Hoechst Aktiegesellschaft. Process for the preparation of dicalcium phosphate. 5,024,825, Cl. 423-309.000.

Buhl Industries, Inc.: *See—*
Kyhl, Henry, 5,025,320, Cl. 358-229.000.

Bujatti, Marina; and Sechi, Franco N., to Microwave Power, Inc. Method of manufacturing a microwave intergrated circuit substrate including metal lined via holes. 5,023,994, Cl. 29-852.000.

Bullen, David J., to BP Chemicals Limited. Crosslinkable silyl polymer composition. 5,025,071, Cl. 525-326.500.

Bulso, Joseph D., Jr.; and McClung, James A., to Redicon Corporation. Method for forming container with profiled bottom. 5,024,077, Cl. 72-336.000.

Buma, Shuuichi: *See—*
Kokubo, Kouichi; Hamada, Toshiaki; Tagawa, Shinichi; Suzumura, Nobuyasu; Buma, Shuuichi; Aburaya, Toshio; Onuma, Toshio; Sato, Kunihito; Yonekawa, Takashi; Kawanishi, Masaki; Ikemoto, Hiroyuki; and Ohashi, Kaoru, 5,024,459, Cl. 280-707.000.

Bunch, Earnest B., III, to B. Bunch Company, Inc. Continuous form stationery folding and cutting machine. 5,024,644, Cl. 493-357.000.

Bunegin, Leonid: *See—*
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Bunnelle, William L.: *See—*
Malcolm, David B.; and Bunnelle, William L., 5,024,667, Cl. 604-382.000.

Burack, John J.; LeGrange, Jane D.; and Townsend, Wesley P., to AT&T Bell Laboratories. Composite films with Langmuir-Blodgett component. 5,024,873, Cl. 428-220.000.

Burch, Robert R., to Du Pont de Nemours, E. I., and Company. Metallized polymers and method. 5,024,858, Cl. 427-123.000.

Burge, Donald G., to Parker Hannifin Corporation. Push-in tube fitting and release tool. 5,024,468, Cl. 285-39.000.

Burgel, Frank: *See—*
Pape, Robert; Rose, William; Burgel, Frank; and Adams, Chip, 5,023,996, Cl. 30-144.000.

Burger, Bernd: *See—*
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Burlington Industries, Inc.: *See—*
Hill, Berlie R.; Watson, Thomas F., Sr.; and Triplett, Benny L., 5,024,875, Cl. 428-267.000.

Burndy Corporation: *See—*
Piorunneck, Heinz, 5,024,609, Cl. 439-637.000.

Burnier, Julia S., to Hercules Incorporated. Organosilicon composition comprising stabilizer. 5,025,048, Cl. 524-99.000.

Burns, Gary T., to Dow Corning Corporation. Methylpolysilanes and method for their preparation. 5,025,075, Cl. 528-33.000.

Burton, James F.; and Henke, Daniel L., to Meridian Enterprises, Inc. System and method for administration of incentive award program through use of credit. 5,025,372, Cl. 364-406.000.

Burton, Russell J.: *See—*
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Busch, Bruce D.; and Nicholls, Jeffrey R., to Fremont Industries, Inc. Boiler and boiler water treatment system. 5,024,783, Cl. 252-180.000.

Busch, Raymond A.; and Patterson, John F., to Advanced Nuclear Fuels Corporation. Bimetallic spring member for radiation environment. 5,024,426, Cl. 267-158.000.

Busnel, Rene-Guy; and Argy, Gilles, to Hutchinson. Process for preparing a prophylactic device made of rupturable microcapsules and layers of elastomeric material. 5,024,852, Cl. 427-2.000.

Butler, Myron C.: *See—*
Hilligoss, William R.; Hillogoss, Lawrence D.; Van Winkle, David; and Butler, Myron C., 5,025,466, Cl. 379-1.000.

Butt, Sheldon H.: *See—*
SinghDeo, Narendra N.; Mahulikar, Deepak; and Butt, Sheldon H., 5,024,883, Cl. 428-323.000.

Buttermore, William H.: *See—*
Chriswell, Colin D.; Markuszewski, Richard; and Buttermore, William H., 5,024,753, Cl. 209-1.000.

Byrne, John W.: *See—*
Speronello, Barry K.; Byrne, John W.; and Chen, James M., 5,024,981, Cl. 502-67.000.

Cabasso, Israel: *See*—
Smid, Johannes; Cabasso, Israel; Obligin, Alan; and Rawls, H. Ralph, 5,024,232, Cl. 128-654.000.
Cahill, Claire M. Paint brush cleaning system. 5,024,705, Cl. 134-38.000.
Cahill, Michael J.: *See*—
Brink, Andre; Cahill, Michael J.; Dawson, John; Gardner, Juilian W.; and Thierry, Alan A., 5,024,333, Cl. 209-535.000.
Cama, Lovji D.: *See*—
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Cameron, Charles; Mimoun, Hubert; Robine, Alain; Bonnaudet, Serge; Chaumette, Patrick; and Dang Vu, Quang, to Institut Francais du Petrole. Process for producing olefins from natural gas. 5,025,108, Cl. 585-500.000.
Campbell, Edward N.: *See*—
Lindhuber, Thomas C.; and Campbell, Edward N., 5,024,488, Cl. 301-108.00S.
Campbell, Gaines P., Jr. Sheeter for web fed printing press. 5,024,128, Cl. 83-26.000.
Campbell, Neil E.; and Park, Chinsoo, to Bio Medic Data Systems, Inc. Method of forming an animal marker implanting system. 5,024,727, Cl. 156-663.000.
Cancer Biologics of America, Inc.: *See*—
Van Dyke, Knox, 5,025,020, Cl. 514-280.000.
Cancer Diagnostics, Inc.: *See*—
Guirguis, Raouf A., 5,024,238, Cl. 128-771.000.
Candow, A. J. Detachable golf putter extension. 5,024,438, Cl. 273-81.00R.
Canfield, Barth A., to RCA Licensing Corporation. Odd/even field detector for video signals. 5,025,496, Cl. 358-153.000.
Canivenc, Edith; Forestier, Serge; Gay, Michel; Lang, Gerard; and Richard, Herve, to Rhone-Poulenc Chimie. Diorganopolysiloxanes containing dibenzoylmethane functional groups. 5,025,053, Cl. 524-265.000.
Cannell, Timothy A., to Guth Lighting Inc. Dust resistant electric light fixture. 5,025,358, Cl. 362-267.000.
Canon Kabushiki Kaisha: *See*—
Kanai, Masahiro; Aoike, Tatsuyuki; Matsuda, Koichi; and Kawakami, Soichiro, 5,024,706, Cl. 136-258.000.
Mihara, Chieko; Santoh, Tsuyoshi; and Sugata, Hiroyuki, 5,024,917, Cl. 430-271.000.
Neishi, Toshie; Kikuchi, Toshihiro; Takiguchi, Takao; Suzuki, Koichi; and Matsumoto, Masakazu, 5,024,912, Cl. 430-59.000.
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Sato, Yukou; and Kukimoto, Tsutomu, 5,024,915, Cl. 430-110.000.
Suzuki, Hidetoshi; Nomura, Ichiro; Majima, Toshiaki; and Yamamoto, Mitsuru, 5,025,196, Cl. 315-168.000.
Yoshiura, Yoshio, 5,025,497, Cl. 358-425.000.
Canterberry, J. B.; and Flanigan, David A., to Thiokol Corporation. Rapid burning propellant charge for automobile air bag inflators, rocket motors, and igniters therefor. 5,024,160, Cl. 102-323.000.
Car Mate Mfg. Co., Ltd.: *See*—
Sone, Toshiyuki; Matsumoto, Takehiko; Omotezako, Nobuya; and Kawasuji, Keiji, 5,025,338, Cl. 360-99.060.
Caraballo, Damian F. Terminal connector assembly. 5,024,619, Cl. 439-755.000.
Carbone, Stefano: *See*—
Cucchi, Silvio; and Carbone, Stefano, 5,025,460, Cl. 375-118.000.
Carborundum Company, The: *See*—
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Cardiovascular Imaging Systems, Inc.: *See*—
Leary, James J.; and McKenzie, John R., 5,024,234, Cl. 128-663.010.
Carey, James R.: *See*—
Crain, Ronald A.; Harney James D.; and Carey, James R., 5,025,436, Cl. 369-77.200.
Carl Freudenberg, Firma: *See*—
Andra, Rainer H., 5,024,120, Cl. 74-574.000.
Schwerdt, Hans-Werner, 5,024,425, Cl. 267-140.100.
Carl Hurth Maschinen- und Zahnradfabrik GmbH & Co.: *See*—
Parzl, Franz; and Eichinger, Johann, 5,024,122, Cl. 74-606.00R.
Carl-Zeiss-Stiftung, Heidenheim/Brenz: *See*—
Breyer, Karl-Hermann, 5,024,003, Cl. 33-561.000.
Carlsen, George D., II; and Vale, Ronald W. Hemispherical speaker system. 5,025,473, Cl. 381-88.000.
Carlsson, Claes-Goran: *See*—
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Carney, John M.; and Floyd, Robert A., to Oklahoma Medical Research Foundation; and University of Kentucky Research Foundation. Phenyl butyl nitrone compositions and methods for treatment of oxidative tissue damage. 5,025,032, Cl. 514-400.000.
Caron, Paul R.: *See*—
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Carondelet Foundry Company: *See*—
Culling, John H., 5,024,812, Cl. 420-49.000.
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Cook, Robert L.; Porter, Thomas K.; and Carpenter, Loren C., 5,025,400, Cl. 364-522.000.
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Dempsey, Daniel J., 5,024,379, Cl. 237-16.000.
Carrier Kheops Bac.: *See*—
Savin, Antoine; and Salaun, Jacques, 5,024,604, Cl. 439-345.000.
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Fortmann, Robert C.; Pinnow, Curtis C.; Kuschewski, Gustav; and Joseph, William A., Jr., 5,025,132, Cl. 219-401.000.
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Casal, Andre . Material-removal woodworking tool. 5,024,000, Cl. 30-475.000.
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Genda, Kohei; and Murai, Kazuaki, 5,025,413, Cl. 364-900.000.
Kuriyama, Yuji, 5,025,427, Cl. 368-29.000.
Suzuki, Satoshi; Kuwabara, Osamu; Muto, Jiro; and Shinozaki, Eiichi, 5,025,348, Cl. 361-398.000.
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Graze, Russell R., Jr., 5,024,193, Cl. 123-259.000.
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Nesburn, Anthony B.; Gorin, Michael; Martinez, Marvin; Kenney, M. Cristina; and Maguen, Ezra, 5,024,742, Cl. 204-157.680.
Center for Innovative Technology: *See*—
Richards, David W.; and Murphy, Kent A., 5,024,518, Cl. 351-219.000.
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Inlow, Duane; and Maiorella, Brian, 5,024,947, Cl. 435-240.310.
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Fanta, Thomas O.; and Chabala, Leonard V., 5,025,171, Cl. 307-150.000.
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Chang, Chen-Chi P.; and Li, Mei. Manufacturing high speed low leakage radiation hardened CMOS/SOI devices. 5,024,965, Cl. 437-57.000.
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Chang, Suae-Chen, to Ethyl Corporation. Rocket motor insulation using phosphonitrilic elastomeric compositions. 5,024,860, Cl. 427-230.000.

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Charpak, Georges, to Biospace Instruments. Method and device for determining the distribution of βrays emerging from a surface. 5,025,162, Cl. 250-385.200.

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Gatza, Ward K.; and Chasteen, Ronald E., 5,024,205, Cl. 123-632.000.

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Oldham, James G.; Spencer, Charles R.; Begley, Carl L.; and Meyer, H. Robert, 5,025,150, Cl. 250-253.000.

Chen, Chengjun J., to International Business Machines Corp. Method for self-inducted repair of circuit shorts and near-shorts. 5,024,725, Cl. 156-643.000.

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Speronello, Barry K.; Byrne, John W.; and Chen, James M., 5,024,981, Cl. 502-67.000.

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Vora, Rohitkumar H.; and Chen, Paul N., Sr., 5,025,089, Cl. 528-353.000.

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Anderson, Donald J.; Duerksen, John H.; McCalhum, Doug J.; and Petrick, Mark, 5,024,275, Cl. 166-303.000.
Liston, Thomas V., 5,024,773, Cl. 252-42.700.

Chhabra, Navjot, to Micron Technology, Inc. Semiconductor processing apparatus for creating back pressure within a quartz furnace tube. 5,024,599, Cl. 432-226.000.

Chiang, Yunn H.; and Gaudiana, Russell A., to Polaroid Corporation. Process and materials for thermal imaging. 5,024,989, Cl. 503-227.000.

Chiarito, Richard J., to Everfilt Corporation. Liquid filter and methods of filtration and cleaning of filter. 5,024,771, Cl. 210-791.000.

Chiba, Shunich: *See*—
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Robertson, Bengt; and Curstedt, Tore, 5,024,995, Cl. 514-21.000.

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Needham, Thomas E.; Wright, Jeremy C.; Pearson, Steve; Chilamkurti, Rao; and Kopp, Clinton V., 5,024,657, Cl. 604-85.000.

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Perrine, Susan, 5,025,029, Cl. 514-381.000.

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Johary, Arun; and Rosenau, Mark A., 5,025,315, Cl. 358-140.000.

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Winkler, Hans-Henning; and Rutschle, Eugen, 5,023,983, Cl. 29-27.00R.

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Chiu, Kuen-Wai; Yu, Lin-Chen; and Strickler, John R., to Mine Safety Appliances Company. Preparation of indole and indole derivatives. 5,025,096, Cl. 544-234.000.

Chlipala, James D.: *See*—
Billig, James N.; Chlipala, James D.; Lee, Kuo H.; and Nagy, William J., 5,025,300, Cl. 357-51.000.

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Stackpool, Michael; and Riley, David, 5,024,675, Cl. 29-623.100.

Cho, Gyung Y. Single port dual RAM. 5,025,421, Cl. 365-230.050.

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Chow, Alan Y. Artificial retina device. 5,024,223, Cl. 128-419.00R.

Christell, Lance A.; and Kafka, Fred Y., to Du Pont de Nemours, E. I., and Company. Extrusion isolation of blends of rubber and asphalt. 5,025,044, Cl. 523-334.000.

Christensen, Arnold: *See*—
Anthony, Michael; Ohler, Craig A.; and Christensen, Arnold, 5,024,132, Cl. 84-312.00R.

Christenson, Philip A.; Eilerman, Robert G.; Riker, Paul J.; and Drake, Brian J., to BASF K&F Corporation. Sulfur containing acyclic terpenes. 5,024,847, Cl. 426-535.000.

Chriswell, Colin D.; Markuszewski, Richard; and Buttermore, William H., to Iowa State University Research Foundation, Inc. Material separation efficiency determination employing fluorescing control particles. 5,024,753, Cl. 209-1.000.

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Smith, Tempel, Jr.; Miletic, Veselko; Bayer, George; Coutre, Christopher A.; Reichel, William L.; and Chronowski, Mirek J., 5,025,223, Cl. 324-662.000.

Chrysler Corporation: *See*—
Bakker, Emile A. M., 5,024,187, Cl. 123-193.00H.
Deweerdt, Kevin R., 5,024,345, Cl. 220-366.000.
Elwell, John R., 5,024,411, Cl. 248-311.200.
Khalifa, Mustafa A.; and Chapp, James, Jr., 5,024,118, Cl. 74-492.000.
Waller, Roger A., 5,024,687, Cl. 55-316.000.

Chu, George H.; Ogawa, Yasushi; McPherson, John M.; Ksander, George; Pratt, Bruce; Hendricks, Diana; and McMullin, Hugh, to Collagen Corporation. Collagen wound healing matrices and process for their production. 5,024,841, Cl. 424-422.000.

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Bhagwat, Shripad S.; Main, Alan J.; and Rodriguez, Herman R., 5,025,025, Cl. 514-340.000.
Blyakhman, Yefim; and Lee, Byung H., 5,025,095, Cl. 568-652.000.
Dobinson, Bryan; and Southcott, Mark R., 5,025,084, Cl. 528-229.000.
Pfenninger, Johannes, 5,025,041, Cl. 523-171.000.
Steinmann, Alfred, 5,024,916, Cl. 430-270.000.
Zink, Rudolf; and Phaff, Rox, 5,024,988, Cl. 503-212.000.

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Cioffi, Joseph V.; and Kerrey, John S., to Westinghouse Electric Corp. Enhanced debris filter bottom nozzle for a nuclear fuel assembly. 5,024,806, Cl. 376-352.000.

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Perona, Mark; Woller, Tom C.; and Guy, Jon S., 5,025,334, Cl. 360-96.500.

Citizen Watch Co., Ltd.: *See*—
Egawa, Shunji; and Yamada, Masato, 5,024,533, Cl. 374-126.000.

CLAAS OHG: *See*—
Harig, Horst; and Kersting, Hermann, 5,024,630, Cl. 460-21.000.
Heidjann, Franz; and Kleingraeber, Karl-Josef, 5,024,631, Cl. 460-75.000.

Clairol Incorporated: *See*—
Pan, Yuh-Guo; and Hochman, Lana, 5,024,673, Cl. 8-414.000.

Claus, Kenneth G.; Schoppe, Dwaine W.; and Earlam, Matthew R., to Dow Chemical Company, The. Process for producing a reactive metal-magnesium alloy. 5,024,737, Cl. 204-71.000.

Clauss, Wolfgang; Kurze, Werner; Leifeld, Ferdinand; and Wassenberg, Willy, to Raschig AG. Process for electroplating utilizing disubstituted ethane sulfonic compounds as electroplating auxiliaries and electroplating auxiliaries containing same. 5,024,736, Cl. 204-49.000.

Clayton, James L.; and Gewin, Robert E., to Phoenix Microsystems, Inc. Communications error detection system. 5,025,444, Cl. 371-34.000.

Clorox Company, The: *See*—
Finn, Leslie E.; Swatling, Donald K.; and Mankin, Erle D., 5,024,782, Cl. 252-174.130.

Close, Frederick C.: *See*—
Bannister, Raymond L.; Close, Frederick C.; and Loeber, Peter J., 5,024,153, Cl. 101-91.000.

Cloth, Helmut. Releasing device for a parachute. 5,024,400, Cl. 244-147.000.

Cloud, Randy G.; and Pretchel, David A., to Minnesota Mining & Manufacturing Company. Method and apparatus for making a jumper connector. 5,024,798, Cl. 264-272.150.

CMB Foodcan plc: *See*—
Hemus, David S., 5,024,317, Cl. 198-415.000.

Coble, James R.: *See*—
Diehl, Phillip C.; and Coble, James R., 5,023,968, Cl. 5-82.00R.

Codex Corporation: *See*—
Ahmed, Hassan M., 5,025,457, Cl. 375-106.000.

Coe, Everett L., Jr.: *See*—
Krigmont, Henry V.; Coe, Everett L., Jr.; and Southam, Barry J., 5,024,171, Cl. 110-345.000.

Coflexip: *See*—
Ochsner, Richard, 5,024,252, Cl. 138-130.000.

Cohen, Mordechai, to Sundstrand Corporation. Valve actuator. 5,024,416, Cl. 251-78.000.

Cohrs, Richard B., to Von Duprin, Inc. Flushbolt actuator assembly. 5,024,472, Cl. 292-182.000.

Colas S.A.: *See*—
Baillemont, Ghislaine; and Beauverd, Jean, 5,024,552, Cl. 404-31.000.

Cole, Frank: *See*—
Coone, Malcolm G.; Ehlinger, Jeffry C.; and Cole, Frank, 5,024,273, Cl. 166-289.000.

Cole, Ronald E.; and Amonett, Daniel K., to Emhart Industries Inc. Can operated timer with improved housing. 5,025,117, Cl. 200-38.00R.

Coles, Kenneth G., to Conveyor Co. of Australia Pty. Ltd. Rotation method and apparatus. 5,023,974, Cl. 452-177.000.

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Grecsek, John J., 5,024,778, Cl. 252-140.000.

Collagen Corporation: *See*—
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Collard, Marie-Paule: *See*—
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Collins, Dane H. Decorative message display. 5,024,011, Cl. 40-124.100.

Collins, Glenn B.; Hildebrand, David F.; Lazzeri, Paul A.; Adams, Thomas R.; Parrott, Wayne A.; and Hartweck, Lynn M., to Lubrizol Genetics, Inc.; and University of Kentucky Research Foundation, Inc., The. Transformation, somatic embryogenesis and whole plant regeneration method for Glycine species. 5,024,944, Cl. 435-172.300.

Colquhoun, Alexander; and Berchtold, Klaus, to Telefunken electronic GmbH. Measuring system. 5,025,260, Cl. 342-127.000.

Colton, Douglas E.: *See*—
Faulkner, W. Harrison, III; and Colton, Douglas E., 5,024,709, Cl. 156-69.000.

Colvert, James H., to Texaco Inc. Control system for delayed coker. 5,024,730, Cl. 196-132.000.

Colvin, Alex D.; Graham, Daniel J.; and Cassatta, Joseph C., to Ford Motor Company. Continuous measurement of the absolute conductivity of a liquid. 5,025,220, Cl. 324-449.000.

Com Dev Ltd.: *See*—
Pramanick, Protap, 5,025,235, Cl. 333-204.000.

Combustion Engineering, Inc.: *See*—
Bachman, William H., 5,024,810, Cl. 376-438.000.
Hatfield, Stephen C.; Andrews, Mena G.; and Broders, Richard P., 5,024,807, Cl. 376-352.000.

Commonwealth Scientific and Industrial Research Organisation: *See*—
Watt, John S., 5,025,160, Cl. 250-356.100.

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Hilligoss, William R.; Hillogoss, Lawrence D.; Van Winkle, David; and Butler, Myron C., 5,025,466, Cl. 379-1.000.

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Gerard, Evelyne; Molle, Roger; and Debaisieux, Andre, 5,025,228, Cl. 331-69.000.

Conner Peripherals, Inc.: *See*—
Stefansky, Frederick M., 5,025,335, Cl. 360-97.010.

Contec Chemieanlagen GmbH: *See*—
Gast, Eduard; and Semmler, Peter, 5,024,708, Cl. 149-19.100.

Continental Can Company, Inc.: *See*—
Pfaffmann, George D.; Kubis, Charles S.; Currie, John P.; Balzer, Norbert R.; Walter, John; and Adams, Graham R., 5,025,123, Cl. 219-10.750.

Conveyor Co. of Australia Pty. Ltd.: *See*—
Coles, Kenneth G., 5,023,974, Cl. 452-177.000.

Cook, James, Jr., to Scientific-Atlanta, Inc. Multi-element antenna system and array signal processing method. 5,025,493, Cl. 342-374.000.

Cook, Robert H., to Ford Motor Company. Hydraulic rebound stop assembly for a shock absorber. 5,024,301, Cl. 188-284.000.

Cook, Robert L.; Porter, Thomas K.; and Carpenter, Loren C., to Pixar. Pseudo-random point sampling techniques in computer graphics. 5,025,400, Cl. 364-522.000.

Cook, Steven L., to Eastman Kodak Company. Preparation of aqueous solutions of acetoacetamide. 5,025,106, Cl. 564-199.000.

Cooke, John: *See*—
Loscalzo, Joseph; and Cooke, John, 5,025,001, Cl. 514-91.000.

Cooley, William G., to USX Corporation. Interlocking snorkel refractory. 5,024,421, Cl. 266-210.000.

Coone, Malcolm G.; Ehlinger, Jeffry C.; and Cole, Frank, to Davis-Lynch, Inc. Cementing apparatus and method. 5,024,273, Cl. 166-289.000.

Cooper, Graham A.: *See*—
Bottomley, Ian E.; and Cooper, Graham A., 5,024,368, Cl. 228-118.000.

Corbett, Peter F.: *See*—
Hartley, Richard I.; Corbett, Peter F.; Yassa, Fathy F.; and Noujaim, Sharbel E., 5,025,257, Cl. 341-101.000.

Corcoran, Boyd L.: *See*—
Abdelrazik, Mohamed A.; Martin, John D.; and Corcoran, Boyd L., 5,025,262, Cl. 343-705.000.

Cordfunke, Erik H. P.; and Tool, Cornelis J. J., to Ultra-Centrifuge Nederland N.V. Apparatus for separating isotopes of uranium. 5,025,152, Cl. 250-281.000.

Corning Incorporated: *See*—
Allaire, Roger A.; Friske, Mark S.; Hagg, Sandra L.; and Janas, Victor F., 5,024,978, Cl. 501-95.000.
Grossman, David G.; Karnas, Michael A.; and Johnson, Ronald E., 5,024,790, Cl. 264-16.000.

Coryea, Peter F.: *See*—
Germer, Warren R.; Coryea, Peter F.; Keturakis, Andrius A.; Masury, David H.; and Stevens, Thomas H., 5,025,206, Cl. 324-74.000.

Costanza, Daniel W.: *See*—
Nowak, William J.; Attardi, Anthony A.; and Costanza, Daniel W., 5,025,291, Cl. 355-273.000.

Cousse, Henri: *See*—
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Coutiere, Dominique, to Biolandes. Mechanism for charging and discharging a closed chamber utilizable as an extraction tank of a continuous vegetable material extraction unit and extraction process comprising an application thereof. 5,024,820, Cl. 422-261.000.

Coutre, Christopher A.: *See*—
Smith, Tempel, Jr.; Miletic, Veselko; Bayer, George; Coutre, Christopher A.; Reichel, William L.; and Chronowski, Mirek J., 5,025,223, Cl. 324-662.000.

Coutureau, Thierry: *See*—
Bouillot, Jean-Michel; Coutureau, Thierry; and Decuyper, Patrick G., 5,025,241, Cl. 336-100.000.

Coverstone, Randy A.: *See*—
Baker, Jeffrey P.; La, Duong T.; and Coverstone, Randy A., 5,025,271, Cl. 346-140.00R.

Cox, Vernon F.; and Hyde, Phillip M., to Westland Helicopters Limited. Transmission shaft with shear section and debris retainer. 5,024,632, Cl. 464-33.000.

Craft, Adam B.; and Torok, Gabor P., to AT&T Bell Laboratories. Technique for reducing electromagnetic interference. 5,025,211, Cl. 324-158.00R.

Crain, Ronald A.; Harney James D.; and Carey, James R., to Literal Corporation. Disk cartridge positioning mechanism for an information storage disk drive system. 5,025,436, Cl. 369-77.200.

Cramer, Richard D., III; and Wold, Svante B. Comparative molecular field analysis (CoMFA). 5,025,388, Cl. 364-496.000.

Crater, Davis H.; Howells, Richard D.; Stern, Richard M.; and Temperante, John A., to Minnesota Mining and Manufacturing Company. Fluorochemical oxazolidinones. 5,025,052, Cl. 524-104.000.

Craun, Gary P.; and Kunz, Barbara L., to Glidden Company, The. Ionomeric coatings. 5,025,063, Cl. 524-560.000.

Crema, Stefano C.; Kucera, Clare H.; Konrad, Gerd; and Hartmann, Heinrich, to BASF. Fluid loss control additives for oil well cementing compositions. 5,025,040, Cl. 523-130.000.

Crispo, Cesare. "Z" type steerable balanced power transmission. 5,024,639, Cl. 475-221.000.

Critchlow, Graham, to Simon Container Machinery Limited. Heated roll. 5,024,266, Cl. 165-89.000.

Critikon, Inc.: *See*—
Tan, Josef N. S., 5,024,226, Cl. 128-633.000.

Crown Iron Works Company: *See*—
Moses, Darcy, 5,024,148, Cl. 99-618.000.

Crystals International: *See*—
Little, Cindy E., 5,024,848, Cl. 426-587.000.

CSL Group Inc., The: *See*—
Johnston, William H., 5,024,568, Cl. 414-142.200.

Csongor, Rezso J.; and Tangradi, Leroy J., to General Electric Company. Multi-feed, multi-channel communication system. 5,025,485, Cl. 455-12.000.

Cucchi, Silvio; and Carbone, Stefano, to Telettra-Telefonia Elettronica e Radio S.p.A. System and circuits for the processing and transmission of a clock signal, in particular of the video synchronization frequency. 5,025,460, Cl. 375-118.000.

Cuervo, Vincent. Method and system for providing verifiable line of credit information. 5,025,138, Cl. 235-379.000.

Culley, Scott A.: *See*—
Hanlon, J. Vincent; and Culley, Scott A., 5,024,775, Cl. 252-52.00R.

Culling, John H., to Carondelet Foundry Company. Hydrochloric acid resistant stainless steel. 5,024,812, Cl. 420-49.000.

Cummins Engine Company, Inc.: *See*—
Free, Paul D.; Doszpoly, B.; Villanyi, Tibor J.; and Olson, David A., 5,024,200, Cl. 123-501.000.

Curiel, Ray, to Envirolite Products, Inc. Direct current salt water activated generator. 5,024,904, Cl. 429-27.000.

Currie, John P.: *See*—
Pfaffmann, George D.; Kubis, Charles S.; Currie, John P.; Balzer, Norbert R.; Walter, John; and Adams, Graham R., 5,025,123, Cl. 219-10.750.

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Robertson, Bengt; and Curstedt, Tore, 5,024,995, Cl. 514-21.000.

Cusano, Dominic A.; and Yeager, Gary W., to General Electric Company. Method of producing a photostimulable x-ray image convertor. 5,024,791, Cl. 264-21.000.

Cuzmar, Ruth M.: *See—*
Moss, Mary G.; Brewer, Terry; Cuzmar, Ruth M.; Hawley, Dan W.; and Flaim, Tony D., 5,024,922, Cl. 430-330.000.

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Tooley, Patricia A.; Cheung, Tin-Tack P.; Cymbaluk, Ted H.; Nowack, Gerhard P.; and Johnson, Marvin M., 5,024,683, Cl. 55-74.000.

Cymer Laser Technologies: *See—*
Anderson, Stuart L.; and Sandstrom, Richard L., 5,025,445, Cl. 372-20.000.

D. Swarovski & Co.: *See—*
Buchbauer, Burkhart, 5,024,713, Cl. 156-221.000.

Daggett, Kenneth E., to Staubli International AG. Robotic workcell control system with a binary accelerator providing enhanced binary calculations. 5,025,390, Cl. 364-513.000.

Daicel Chemical Industries Co., Ltd.: *See—*
Suzuki, Hajime, 5,025,070, Cl. 525-184.000.

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Okabayashi, Norio, 5,024,744, Cl. 204-194.000.
Ueda, Mitsuru; Kanno, Tatsuya; Iguchi, Yoshihiro; and Oshino, Yasuhiro, 5,025,083, Cl. 528-199.000.

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Zivkovic, Milorad, 5,024,056, Cl. 60-550.000.

Dainichiseika Color & Chemicals Mfg. Co., Ltd.: *See—*
Hanada, Kazuyuki; Kuroda, Kohichi; Misaizu, Iwao; Kashimura, Masashi; Goto, Tomoko; and Kuriyama, Katsumi, 5,024,893, Cl. 428-423.100.

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Morita, Tsuyoshi; Shimazu, Kyotaro; and Furukawa, Masataka, 5,024,728, Cl. 159-27.400.

Dalby, James F., to MRJ Group, Inc. Method and apparatus for joining structural members. 5,024,549, Cl. 403-404.000.

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Bolan, Michael L., 5,025,141, Cl. 235-472.000.
Klughart, Kevin M., 5,025,486, Cl. 455-54.000.
Mounger, Robert W., 5,025,177, Cl. 307-355.000.

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Dalrymple, Monte J.; Verinsky, Phillip D.; and Smith, Don, to Zilog, Inc. Universal bus interface. 5,025,412, Cl. 364-900.000.

Dames, Andrew N., to Schlumberger Industries Limited. Combined output and drive circuit for a mass flow transducer. 5,024,104, Cl. 73-861.370.

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Blessing, Martin G., 5,024,634, Cl. 475-86.000.
Lindhuber, Thomas C.; and Campbell, Edward N., 5,024,488, Cl. 301-108.00S.

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Brenner, Michael B.; Strominger, Jack L.; Seidman, Jonathan; Ip, Stephen H.; and Krangel, Micahel S., 5,024,940, Cl. 435-69.100.

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Cameron, Charles; Mimoun, Hubert; Robine, Alain; Bonnaudet, Serge; Chaumette, Patrick; and Dang Vu, Quang, 5,025,108, Cl. 585-500.000.

Dany, Franz-Josef: *See—*
Buhl, Horst; Holz, Josef; and Dany, Franz-Josef, 5,024,825, Cl. 423-309.000.

Danzeisen, Klaus, to Rohde & Schwarz GmbH & Co KG. Method of measuring radio-frequency interfering voltages. 5,025,208, Cl. 324-77.00R.

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Hofsess, Alexander; and Dao-Xuan, Phon, 5,024,027, Cl. 51-34.00H.

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Darlington, Alan D.; and Waggitt, Kevin P., to Renishaw plc. Coordinate positioning system. 5,025,362, Cl. 364-167.010.

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Schofield, Harold D.; and Caron, Paul R., 5,025,267, Cl. 346-1.100.
Wendt, Richard W.; and Johnson, Brian, 5,025,399, Cl. 364-519.000.

Daugherty, Harvey S.: *See—*
Lamb, William E.; Kowaleski, Jerome L.; Haikl, Vojtech; Bittancourt, Alan R.; and Daugherty, Harvey S., 5,025,280, Cl. 354-299.000.

Daves, Robert S.: *See—*
Maine, Gregory T.; Daves, Robert S.; and Yocum, Robert R., 5,024,941, Cl. 435-69.900.

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Schwartz, David J., 5,025,369, Cl. 364-200.000.

Davis, Gary C.; McGrath, Barbara E.; and Snow, Kevin M., to General Electric Company. Flame retardant organopolysiloxane-polycarbonate triblock copolymers. 5,025,074, Cl. 528-15.000.

Davis, Kent A.: *See—*
Friedrich, Steven G.; and Davis, Kent A., 5,024,044, Cl. 53-433.000.

Davis-Lynch, Inc.: *See—*
Coone, Malcolm G.; Ehlinger, Jeffry C.; and Cole, Frank, 5,024,273, Cl. 166-289.000.

Davis, Walter L.: *See—*
Mittel, James G.; and Davis, Walter L., 5,025,251, Cl. 340-825.440.

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Brink, Andre; Cahill, Michael J.; Dawson, John; Gardner, Juilian W.; and Thierry, Alan A., 5,024,333, Cl. 209-535.000.

Daxor Corporation: *See—*
Feldschuh, Joseph; and Feldschuh, Jonathan A., 5,024,231, Cl. 128-654.000.

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DEA Mineralol Aktiengesellschaft: *See—*
Mertens-Gottselig, Dagmar; Hammer, Hartmut; Muller, Heinrich; and Wildersohn, Manfred, 5,024,678, Cl. 44-348.000.

Debaig-Valade, Caroline; Filliatre, Claude; and Servens, Christian, to Aerospatiale Societe Nationale Industrielle. Method of forming a fibrous structure composite ceramic material and material thus obtained. 5,024,979, Cl. 501-95.000.

Debaisieux, Andre: *See—*
Gerard, Evelyne; Molle, Roger; and Debaisieux, Andre, 5,025,228, Cl. 331-69.000.

DeCaul, Lorenzo C.; Han, Scott; Palermo, Robert E.; and Walsh, Dennis E., to Mobil Oil Corporation. Process for upgrading methane to higher hydrocarbons. 5,025,109, Cl. 585-500.000.

Deckler, Harry C., to Kinze Manufacturing, Inc. Clutch for chemical dispenser for planter. 5,024,173, Cl. 111-178.000.

DeCrescenzo, Gary A.: *See—*
Getman, Daniel P.; and DeCrescenzo, Gary A., 5,025,021, Cl. 514-302.000.

Decuyper, Patrick G.: *See—*
Bouillot, Jean-Michel; Coutureau, Thierry; and Decuyper, Patrick G., 5,025,241, Cl. 336-100.000.

Deere & Company: *See—*
Gage, Douglas M., 5,024,140, Cl. 91-28.000.
Hadley, Howard C.; and Myers, John R., 5,024,456, Cl. 280-412.000.

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Menet, Jacques; and de Gabrielli, Olivier, 5,025,194, Cl. 315-111.810.

Deguchi, Katsuhiko; Saito, Kozo; Saijo, Hiroyuki; and Tosaka, Masaki, to Kao Corporation. Mild alkyl glycoside-based detergent compositions, further comprising terpene and isothiazolone derivatives. 5,025,069, Cl. 252-174.170.

Deguchi, Naoyasu, to Fuji Photo Film Co., Ltd. Method of forming color image from a color reversal photographic material comprising a specified iodide content and spectral distribution. 5,024,925, Cl. 430-379.000.

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Koberstein, Edgar; Engler, Bernd; Domesle, Rainer; and Schubert, Peter, 5,024,985, Cl. 502-304.000.
Wolff, Siegfried; and Goerl, Udo, 5,025,047, Cl. 524-99.000.

DeHoff, Edward J.: *See—*
Schenk, Donald E.; DeHoff, Edward J.; and Shaw, Schuyler S., 5,024,298, Cl. 188-72.200.
Shaw, Schuyler S.; Hallinan, Linda L.; Hammersmith, Robert J.; Schenk, Donald E.; DeHoff, Edward J.; and Kade, Alexander, 5,024,299, Cl. 188-156.000.

Deibel, Richard J. High-strength quick-disconnect tube filter. 5,024,761, Cl. 210-232.000.

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DeJulio, Emil R.: *See—*
Santanam, Chandran B.; Thomas, William H.; and DeJulio, Emil R., 5,024,170, Cl. 110-264.000.

Dekerle, Benoit, to Societe Anonyme des Eaux Minerales d'Evian. Nipple adapter for a bottle comprising a screw ring. 5,024,341, Cl. 215-11.100.

Del Bianco, Sergio; and Sica, Gigliola, to Industrial Farmaceutica Serono SpA. Combined interferon/antiestrogen therapy for treatment of breast cancer. 5,024,833, Cl. 424-85.400.

Deli, Jack M., to Komatsu Dresser Company. Pivotable, resilient mounting. 5,024,283, Cl. 180-89.140.

DeLuca, Michael J.; Snowden, Gregory O.; and Fennell, Robert D., to Motorola, Inc. Paging receiver with over-the-air characterization of call signal processing. 5,025,252, Cl. 340-825.440.

De Luca, Olivier, to Alcatel N.V. Transversal filter with wide band phase shifters in series with the delay cells. 5,025,234, Cl. 333-166.000.

Demoute, Jean-Pierre; Touyer, Gaetan; and Mouren, Michel, to Rousel Uclaf. Novel radioactive pyrethrinoids and use thereof. 5,024,828, Cl. 424-1.100.

Dempsey, Daniel J., to Carrier Corporation. Variable capacity heating appliance. 5,024,379, Cl. 237-16.000.

Denis, Xavier: *See—*
Soubrier, Pierre; and Denis, Xavier, 5,024,645, Cl. 493-380.000.

Dennis, Anthony H. K.: *See—*
Lean, Gordon D.; and Dennis, Anthony H. K., 5,024,286, Cl. 180-206.000.

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Bourque, Donald L., 5,024,365, Cl. 227-67.000.
Pitts, Warren R.; Estrada, hayden F.; and West, Peter, 5,024,898, Cl. 428-511.000.

DePellegrini, Donald D.; Acker, William E.; and Hoff, Richard, to University of Pittsburgh. Apparatus and method for proving an anchor in walls and ceilings composed of friable asbestos containing material. 5,024,038, Cl. 52-700.000.

DePinto, Gary A.; Steinberg, Joe; Franka, John G.; and Cherniawski, Michael R., to Motorola, Inc. Deposition of a conductive layer for contacts. 5,024,972, Cl. 437-233.000.

DePuy, Division of Boehringer Mannheim Corporation: *See—*
Smith, Todd S.; and Kelman, David C., 5,024,670, Cl. 623-18.000.

Derbyshire, Rodney L., to Metcal, Inc. Rivet with integral heater. 5,025,128, Cl. 219-200.000.

Derudder, James L.; and Wang, I-Chung W., to General Electric Company. Polycarbonate and polyester blends modified with polyorganosiloxane graft polymers combined with diene rubber-based graft polymers. 5,025,066, Cl. 525-66.000.

Design Tech International, Inc.: *See—*
Long, Robert; and Gottlieb, Mark, 5,024,186, Cl. 123-179.00B.

Desmarais, Armand J., to Hercules Incorporated. Denture adhesive composition. 5,024,701, Cl. 106-35.000.

Deusser, Peter G.: *See—*
Becker, Johann A.; Deusser, Peter G.; and Holzmann, Olar W. R., 5,024,498, Cl. 350-96.100.

Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V.: *See—*
von Redwitz, Heribert, 5,024,526, Cl. 356-73.000.

Deutsche Solvay-Werke GmbH: *See—*
Jakobson, Gerald; Siemanowski, Werner; and Uhlig, Karl-Heinz, 5,024,787, Cl. 260-410.600.

Deutsche Thomson-Braudt GmbH: *See—*
Klank, Otto; and Rottmann, Dieter, 5,025,406, Cl. 364-724.190.

Devon Industries, Inc.: *See—*
Sandel, Dan; Horan, Robert T.; Gaba, Rodolfo; and Ramirez, Bruno J., 5,024,326, Cl. 206-366.000.

Deweerdt, Kevin R., to Chrysler Corporation. Vehicle air venting cap. 5,024,345, Cl. 220-366.000.

DeWitt, Donald E.: *See—*
Van Fossen, Robert A.; Spence, Scott L.; and DeWitt, Donald E., 5,024,294, Cl. 184-108.000.

Dickson, Thomas D., Jr.: *See—*
Schwarze, Ralph W.; and Dickson, Thomas D., Jr., 5,024,318, Cl. 198-465.200.

DIEHL GmbH & Co.: *See—*
Bock, Erich, 5,024,136, Cl. 89-6.000.

Diehl, Phillip C.; and Coble, James R. Removable litter chair insert. 5,023,968, Cl. 5-82.00R.

Diesel Kiki Co., Ltd.: *See—*
Nagasaki, Wataru; Endo, Takuro; Taira, Susumu; and Muramatsu, Hajime, 5,024,087, Cl. 73-516.00R.
Nakajima, Nobuyuki, 5,024,591, Cl. 418-178.000.

Dietrich, Norman R.; Moyer, Ralph S.; and Wong, Yiu-Huen, to AT&T Bell Laboratories. Method of forming a silicon-based semiconductor optical device mount. 5,024,966, Cl. 437-60.000.

Dietz, Henry G. Apparatus for inhalation therapy using triggered dose oxygenator employing an optoelectronic inhalation sensor. 5,024,219, Cl. 128-204.210.

Digital Equipment Corporation: *See—*
Seiler, Larry D.; Pappas, James L.; and Rose, Robert C., 5,025,249, Cl. 340-721.000.
Smith, Alan B., 5,023,991, Cl. 29-603.000.

Dill, Andreas R.: *See—*
Boss, Ernst; Dill, Andreas R.; and Zimmermann, Heinz, 5,024,720, Cl. 156-584.000.

DiLullo, Joseph V.; Schifter, Stephan C.; Negin, Michael; and Paist, Kenneth W., to Secura Corporation. System and method for remotely monitoring the connect/disconnect status of a multiple part vehicle. 5,025,253, Cl. 340-825.060.

Dimos, Duane: *See—*
Garg, Diwakar; Dyer, Paul N.; Schaffer, Leslie E.; Wrecsics, Ernest L.; Dimos, Duane; and Mueller, Carl F., 5,024,901, Cl. 428-627.000.

Dinan, Raymond F.; Fallon, Hugh C.; Malin, Jerald R.; Rodite, Robert R.; Rohe, Clair F.; and Rohrer, Gene D., to International Business Machines Corporation. System for scanning documents without loss of image data. 5,025,483, Cl. 382-58.000.

Dinewitz, Isaac: *See—*
Lindstrom, Walter W.; and Dinewitz, Isaac, 5,024,230, Cl. 128-654.000.

Dingus, George W.: *See—*
Garthaffner, Martin T.; Keen, Billy J., Jr.; Gillespie, Andrew J.; Wheless, Jack C.; and Dingus, George W., 5,024,242, Cl. 131-94.000.

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DiNinno, Frank P.; Salzmann, Thomas N.; and Greenlee, Mark L., to Merck & Co., Inc. 2-(substituted-dibenzofuranyl and dibenzothienyl) carbapenem antibacterial agents. 5,025,008, Cl. 514-210.000.

DiNinno, Frank P.: *See—*
Greenlee, Mark L.; DiNinno, Frank P.; Cama, Lovji D.; and Heck, James V., 5,025,007, Cl. 514-210.000.

Dinter, Peter; Funke, Hermann; and Matschke, Klaus, to Hoechst Aktiengesellschaft. Apparatus for the surface treatment of sheet-like structures by electric corona discharge. 5,024,819, Cl. 422-186.060.

Dion, F. Eugene: *See—*
Morehouse, James H.; Furay, David M.; Blagaila, John; Dion, F. Eugene; Shelstad, Scott A.; and Woods, Jimmy L., 5,025,336, Cl. 360-97.020.

Direktor, David: *See—*
Effenberger, Reinhard; and Direktor, David, 5,025,002, Cl. 514-112.000.

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Hofsess, Alexander; and Dao-Xuan, Phon, 5,024,027, Cl. 51-34.00H.

Dixon, James W.: *See—*
Dixon, Steven C.; and Dixon, James W., 5,024,319, Cl. 198-494.000.

Dixon, Steven C.; and Dixon, James W. Belt heater for conveyors. 5,024,319, Cl. 198-494.000.

Dobinson, Bryan; and Southcott, Mark R., to Ciba-Geigy Corporation. Polyimide-forming compositions. 5,025,084, Cl. 528-229.000.

Dobler, Klaus; and Hachtel, Hansjorg, to Robert Bosch GmbH. Device for determining a length of linear movement or an angle of rotation of a machine part. 5,025,213, Cl. 324-207.120.

Dobson, Peter S.: *See—*
Stanley, Ian W.; Shepherd, John N.; and Dobson, Peter S., 5,024,500, Cl. 350-96.150.

Dodson, Charles L., to Beckman Instruments, Inc. Detecting multiple phases in liquid scintillation samples. 5,025,161, Cl. 250-364.000.

Doege, Mathias; and Frey, Wunibald, to Robert Bosch GmbH. Device for and method of applying voltage to a heating resistor in a motor vehicle in dependency on operating conditions of the vehicle. 5,025,136, Cl. 219-508.000.

Doherty, Annette M.; Hudspeth, James P.; Kaltenbronn, James S.; Repine, Joseph T.; Roark, William H.; Sircar, Ila; and Tinney, Francis J., to Warner-Lambert Company. Renin inhibitors IV. 5,024,994, Cl. 514-18.000.

Dola, Frank P.; Feldman, Steven; Lauterbach, John H.; and Mengelson, William G., to AMP Incorporated. Surface accessible wiring system and assembly. 5,024,614, Cl. 439-114.000.

Domergue, Jean-Paul: *See—*
Maisonneuve, Jean-Michel; Domergue, Jean-Paul; Parize, Gabrielle; Palandjian, Philippe; and Isbert, Jacques, 5,024,502, Cl. 350-96.160.

Domesle, Rainer: *See—*
Koberstein, Edgar; Engler, Bernd; Domesle, Rainer; and Schubert, Peter, 5,024,985, Cl. 502-304.000.

Dominguez, Danilo A.; and Flores, James F. Center beam/center partition flat car and retention assembly. 5,024,567, Cl. 410-100.000.

Dominques, Louis P.: *See—*
Negas, Taki; and Dominques, Louis P., 5,024,980, Cl. 501-134.000.

Domnikov, Larissa: *See—*
Garcia, Gilbert; and Domnikov, Larissa, 5,025,068, Cl. 525-119.000.

Donaldson Company, Inc.: *See—*
Barris, Marty A.; and Wagner, Wayne M., 5,024,054, Cl. 60-274.000.
Jackson, William E., 5,024,870, Cl. 428-181.000.

Donovan, William P.; Gonzalez, Jose M., Jr.; Levinson, Barry L.; and Macaluso, Anthony. Coleopteran active microorganisms, related insecticide compositions and methods for their production and use. 5,024,837, Cl. 424-93.000.

Doraiswamy, Krishna C.: *See—*
Smothers, William K.; Doraiswamy, Krishna C.; and Armstrong, Mark L., 5,024,909, Cl. 430-1.000.

Doss, Brian L.: *See—*
Svetkoff, Donald J.; and Doss, Brian L., 5,024,529, Cl. 356-376.000.

Doszpoly, B.: *See—*
Free, Paul D.; Doszpoly, B.; Villanyi, Tibor J.; and Olson, David A., 5,024,200, Cl. 123-501.000.

Doty, Gerald A.: *See—*
Zygutis, James L.; and Doty, Gerald A., 5,024,391, Cl. 242-107.200.

Doug Bragg Enterprises Ltd.: *See—*
Bragg, R. D.; and Weatherbee, H. Lloyd, 5,024,052, Cl. 56-330.000.

Doussiet, Roger; and Labadie, Louis, to Societe Nationale Elf Aquitaine (Production). Cell for sampling and storing fluid deposits. 5,024,110, Cl. 73-864.620.

Dow Chemical Company, The: *See—*
Claus, Kenneth G.; Schoppe, Dwaine W.; and Earlam, Matthew R., 5,024,737, Cl. 204-71.000.
Hefner, Robert E., Jr.; and Haynes, Deborah I., 5,024,785, Cl. 252-299.010.
McCullough, Francis P., Jr.; Snelgrove, R. Vernon; and Hall, David M., 5,024,877, Cl. 428-282.000.
Relenyi, Attila G.; and Gartner, Charles D., 5,025,038, Cl. 514-665.000.

Dow Corning Corporation: *See—*
Burns, Gary T., 5,025,075, Cl. 528-33.000.
Penticoff, Amy M.; and Lyon, John D., 5,024,937, Cl. 435-41.000.

DowBrands Inc.: *See—*
Gundlach, Douglas P., 5,024,325, Cl. 206-229.000.

Dowd, Joseph P.: *See—*
Thurman, Laurance R.; Dowd, Joseph P.; and Fischer, Kathy J., 5,024,772, Cl. 252-1.000.

Downing, Gerald W. Foldable handrail assembly. 5,024,420, Cl. 256-67.000.

Downs, Walter M.; and Ankrom, Michael J., to Westinghouse Electric Corp. Solder pad/circuit trace interface and a method for generating the same. 5,024,734, Cl. 204-15.000.

Dragerwerk Aktiengesellschaft: *See—*
Maurer, Christoph, 5,024,587, Cl. 417-488.000.

Draghetti, Fiorenzo; and Gamberini, Antonio, to G.D. Societa Per Azioni. Machine for wrapping substantially parallelepiped commodities. 5,024,043, Cl. 53-234.000.

Dragovic, Thomas: *See—*
Anderheggen, Wolfgang; Kraemer, Michael; Vogelsgesang, Roland; Wagner, Wolfram; Olges, Wolfgang; and Dragovic, Thomas, 5,024,797, Cl. 264-143.000.

Drain, Dennis R. Stabilizing device for hand-held/portable electronic device. 5,024,414, Cl. 248-688.000.

Drake, Brian J.: *See—*
Christenson, Philip A.; Eilerman, Robert G.; Riker, Paul J.; and Drake, Brian J., 5,024,847, Cl. 426-535.000.

Draxler, Richard: *See—*
Fantozzi, Louis R.; Kessler, Lawrence; and Draxler, Richard, 5,024,493, Cl. 350-1.300.

Dreier, Friedrich; and Fischer, Ernst, to Robert Bosch GmbH. Shaft bearing with a ball socket in a frame-mounted housing. 5,024,540, Cl. 384-203.000.

Drent, Eit; and Breed, Anthonius J. M., to Shell Oil Company. Polymerization of carbon monoxide with ethylenically unsaturated alcohol. 5,025,092, Cl. 528-392.000.

Dresser Industries, Inc.: *See—*
Ricles, Thomas D., 5,024,277, Cl. 166-381.000.

Drumm, James M.: *See—*
Johnson, Randall E.; and Drumm, James M., 5,025,306, Cl. 357-75.000.

Dubois, Gerald N., III, to Townsend Engineering Company. Safety means for powered machinery. 5,025,175, Cl. 307-326.000.

Dubois, Pascal: *See—*
Fishler, Mark K.; Koten, Jean-Marie; and Dubois, Pascal, 5,024,422, Cl. 266-272.000.

Duerksen, John H.: *See—*
Anderson, Donald J.; Duerksen, John H.; McCallum, Doug J.; and Petrick, Mark, 5,024,275, Cl. 166-303.000.

Dufort, Mario C. Test plug for flanged pipes. 5,024,079, Cl. 73-49.800.

DuFour, Pierre, to Salomon S. A. Sole for a sport shoe. 5,024,007, Cl. 36-127.000.

Dull, Gordon L., to Wisconsin Dairies Cooperative. Cheese drainer pan assembly. 5,024,146, Cl. 99-458.000.

Dumenek, Vladimir A.; Stolyarenko, Georgy E.; and Kossovsky, Leopold V. Ophthalmological device. 5,024,652, Cl. 604-22.000.

Duncan, Marlie A.: *See—*
Razauskas, Anthony F.; and Duncan, Marlie A., 5,024,081, Cl. 73-104.000.

Du Pont de Nemours, E. I., and Company: *See—*
Burch, Robert R., 5,024,858, Cl. 427-123.000.
Christell, Lance A.; and Kafka, Fred Y., 5,025,044, Cl. 523-334.000.
Gerling, Joseph F.; and Kaczmarczyk, Raymond A., Jr., 5,024,356, Cl. 222-312.000.
Hartmann, Hans S., 5,024,975, Cl. 501-65.000.
Linton, Howard R., 5,024,826, Cl. 423-335.000.
Sidwell, Lloyd G.; and Miller, Conrad E., 5,025,164, Cl. 250-483.100.
Smothers, William K.; Doraiswamy, Krishna C.; and Armstrong, Mark L., 5,024,909, Cl. 430-1.000.
Williams, Franklin P., III, 5,025,087, Cl. 528-339.000.
Yeh, An-Gong, 5,024,387, Cl. 241-21.000.

Durand, John E. Signal pickup mechanism. 5,024,085, Cl. 73-256.000.

Durand-Wayland, Inc.: *See—*
Leverett, William H., 5,024,047, Cl. 53-502.000.

Durig, Urs T.; Fischer, Ulrich C.; and Pohl, Wolfgang D., to Ernst Leitz Wetzlar, GmbH; and International Business Machines Company. Sensor for converting a distance to optical and further to electrical energy, and surface scanning apparatus using same. 5,025,147, Cl. 250-216.000.

Duryea, John L.: *See—*
Impink, Albert J., Jr.; Grobmyer, Louis R.; Sariscak, Robert E.; Morita, Toshio; and Duryea, John L., 5,024,801, Cl. 376-217.000.

Duttweiler, Donald L., to AT&T Bell Laboratories. Adaptive probability estimator for entropy encoding/decoding. 5,025,258, Cl. 341-107.000.

Dutzmann, Stefan: *See—*
Lantzsch, Reinhard; Kysela, Ernst; Buchel, Karl H.; Dutzmann, Stefan; Brandes, Wilhelm; and Hanssler, Gerd, 5,025,030, Cl. 514-383.000.

Dye, John F.: *See—*
Ovassapian, Andranik; and Dye, John F., 5,024,218, Cl. 128-200.260.

Dyer, Paul N.: *See—*
Garg, Diwakar; Dyer, Paul N.; Schaffer, Leslie E.; Wrecsics, Ernest L.; Dimos, Duane; and Mueller, Carl F., 5,024,901, Cl. 428-627.000.

Dykstra, Richard A., to Briggs & Stratton Corporation. Capacitive discharge ignition system with continuous timing advance. 5,024,204, Cl. 123-602.000.

Dynamic Engineering, Inc.: *See—*
Weinstein, Leonard M., 5,024,100, Cl. 73-756.000.

E. R. Squibb & Sons, Inc.: *See—*
Aklonis, Carol A.; Ax, Helen A.; Kirsch, Donald R.; O'Sullivan, Joseph; Tymiak, Adrienne; and Wells, J. Scott, 5,024,839, Cl. 424-115.000.
Karanewsky, Donald S., 5,025,000, Cl. 514-80.000.
Karanewsky, Donald S., 5,025,017, Cl. 514-277.000.

E. R. Squibbs & Sons, Inc.: *See—*
Biller, Scott A., 5,025,003, Cl. 514-120.000.

E-Systems, Inc.: *See—*
Abdelrazik, Mohamed A.; Martin, John D.; and Corcoran, Boyd L., 5,025,262, Cl. 343-705.000.

Eames, Loren W.: *See—*
Berg, Joseph A.; and Eames, Loren W., 5,024,485, Cl. 297-312.000.

Earlam, Matthew R.: *See—*
Claus, Kenneth G.; Schoppe, Dwaine W.; and Earlam, Matthew R., 5,024,737, Cl. 204-71.000.

Earp, Ronald L., to AT&T Bell Laboratories. Enhanced bottom sonar system. 5,025,423, Cl. 367-137.000.

Eastman Kodak Company: *See—*
Blount, William W., Jr.; and Zoeller, Joseph R., 5,025,086, Cl. 528-272.000.
Chamberlin, Kim S., 5,025,107, Cl. 564-414.000.
Chapman, Derek D.; and Evans, Steven, 5,024,990, Cl. 503-227.000.
Cook, Steven L., 5,025,106, Cl. 564-199.000.
Ellsworth, Roger D., 5,025,279, Cl. 354-298.000.
Evans, Francis J.; Jones, Ralph W., Jr.; and Wilson, Robert D., 5,024,931, Cl. 430-567.000.
Guslits, Vladimir S.; and Swapceinski, John P., 5,025,289, Cl. 355-253.000.
Hilbert, Thomas K., 5,025,287, Cl. 355-245.000.
Jeffers, Frederick J., 5,025,163, Cl. 250-483.100.
Lougheed, Edgar P.; Richenberg, Carl B.; and Chen, Stephen P., 5,024,929, Cl. 430-546.000.
McClune, Gregory J.; and Bishop, John F., 5,024,935, Cl. 435-7.100.
Morton, Roger A.; and Wetzel, Thomas J., 5,025,480, Cl. 382-50.000.
Ng, Yee S., 5,025,322, Cl. 358-298.000.
Pagano, Daniel M., 5,025,274, Cl. 354-21.000.
Parulski, Kenneth A.; and Kessler, David, 5,025,313, Cl. 358-54.000.
Robison, Gary L., 5,025,283, Cl. 355-40.000.
Silva, Fernando G., 5,025,328, Cl. 360-46.000.
Steele, Lawrence C., 5,025,292, Cl. 355-326.000.
Wu, Stephen H. W.; Greene, Carol J.; and Sharma, Mahendra K., 5,025,004, Cl. 514-165.000.

Eaton Corporation: *See—*
Oliver, James L.; Juriga, James A.; Walton, Erlen B.; and Preston, David M., 5,024,463, Cl. 280-718.000.
Reinicke, Robert H.; Mohtar, Rafic; and Nelson, Richard O., 5,024,418, Cl. 251-129.110.

Eaton, Larry R.: *See—*
Jansen, Michael; Sergant, Moshe; Ou, Szutsun S.; Wilcox, Jaroslava Z.; Yang, Jane J.; and Eaton, Larry R., 5,025,451, Cl. 372-50.000.

Ebihara, Kazyuki: *See—*
Koguchi, Tatsushi; Ito, Shigehiro; Ebihara, Kazyuki; and Nishi, Yuji, 5,025,317, Cl. 358-167.000.

Eckerle, Douglas W.; and Sainburg, Frank P. Poseable doll magnetically secured to its stand. 5,024,611, Cl. 446-268.000.

Edgren, David E.; and Theeuwes, Felix, to ALZA Corporation. Annealed coats. 5,024,842, Cl. 424-473.000.

EDS Technologies, Inc.: *See—*
Watts, Leonard A.; and Espinosa, Medardo, 5,024,569, Cl. 414-790.300.

Edwards, Arthur J., to Motorola, Inc. Circuit for use with a voltage regulator. 5,025,203, Cl. 323-268.000.

Edwards, James C.; and Pritchard, Edward E., to International Paper. Clamshell attachment for log grapple. 5,024,397, Cl. 294-68.230.

Effenberger, Reinhard; and Direktor, David, to Bromine Compounds Ltd. Process for control of microorganisms with phosphorus-based compositions. 5,025,002, Cl. 514-112.000.

Egawa, Shunji; and Yamada, Masato, to Citizen Watch Co., Ltd. Radiation clinical thermometer. 5,024,533, Cl. 374-126.000.

Ehlinger, Jeffry C.: *See—*
Coone, Malcolm G.; Ehlinger, Jeffry C.; and Cole, Frank, 5,024,273, Cl. 166-289.000.

Eich, Manfred; and Wendorff, Joachim, to Rohm GmbH Chemische Fabrik. Device for reversible optical data storage using polymeric liquid crystals. 5,024,784, Cl. 252-299.010.

Eichen, Elliot G., to GTE Laboratories Incorporated. System for transmitting information on interferometrically generated optical carriers. 5,025,487, Cl. 455-618.000.

Eichinger, Johann: *See—*
Parzl, Franz; and Eichinger, Johann, 5,024,122, Cl. 74-606.00R.

Eichner, Fred N.: *See—*
Miller, Steven D.; McDonald, Joseph C.; Eichner, Fred N.; and Tomeraasen, Paul L., 5,025,159, Cl. 250-337.000.

Eilerman, Robert G.: *See—*
Christenson, Philip A.; Eilerman, Robert G.; Riker, Paul J.; and Drake, Brian J., 5,024,847, Cl. 426-535.000.

Eilersen, Jens J. Piece of furniture. 5,023,966, Cl. 5-17.000.

Eimei Company, Ltd.: *See—*
Ishii, Yoichi; and Mihara, Hisashi, 5,024,844, Cl. 424-520.000.

Eisenberg, Morris, to Electrochimica Corporation. Rechargeable electrochemical cell. 5,024,906, Cl. 429-101.000.

Eishin Technology Company, Limited: *See—*
Kubo, Chikanari, 5,024,248, Cl. 137-596.160.

Ekeroth, Douglas E.: *See—*
Veronesi, Luciano; and Ekeroth, Douglas E., 5,025,158, Cl. 250-328.000.

Electric Power Research Institute: *See—*
Chang, Ramsay, 5,024,681, Cl. 55-6.000.

Electrochimica Corporation: *See—*
Eisenberg, Morris, 5,024,906, Cl. 429-101.000.

Elitex Koncern Textiln: *See—*
Fucik, Borivoj; Petranek, Milan; and Smital, Frantisek, 5,024,068, Cl. 66-53.000.

Ellsworth, Roger D., to Eastman Kodak Company. Process for replenishing solutions in a film processor. 5,025,279, Cl. 354-298.000.

Elwell, John R., to Chrysler Corporation. Beverage container holder. 5,024,411, Cl. 248-311.200.

Ema, Taiji, to Fujitsu Limited. Metal insulator semiconductor type dynamic random access memory device. 5,025,294, Cl. 357-23.600.

Emhart Industries Inc.: *See—*
Cole, Ronald E.; and Amonett, Daniel K., 5,025,117, Cl. 200-38.00R.

Emori, Kiyoshi; and Maekawa, Hiroshi, to Minolta Camera Kabushiki Kaisha. Deveoloping unit switching device for a printer. 5,025,323, Cl. 358-300.000.

Emoto, Masami, to Ricoh Company, Ltd. Recording and reproducing optical information device which converts the first beam into a second beam having different light intensity distribution. 5,025,438, Cl. 369-112.000.

Empire Research Corporation: *See—*
Wender, Harry; and Avila, Augusto F., 5,024,661, Cl. 604-110.000.

Ems, Josef: *See—*
Bergmann, Konrad; Ems, Josef; and Nikolayczik, Hans, 5,024,378, Cl. 236-93.00B.

Enderlin, Robert, to Superba S.A. Apparatus with endless screws for forming flat loops of textile yarn. 5,024,390, Cl. 242-47.000.

Enders, Gerd: *See—*
Kuesters, Karl-Heinz; Mueller, Wolfgang; and Enders, Gerd, 5,025,295, Cl. 357-23.600.

Endo, Takuro: *See—*
Nagasaki, Wataru; Endo, Takuro; Taira, Susumu; and Muramatsu, Hajime, 5,024,087, Cl. 73-516.00R.

Endo, Yasushi; Kato, Mikihiko; Kawamata, Toshio; and Masaki, Kouichi, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 5,024,885, Cl. 428-329.000.

Endoh, Tetsuhiko: *See—*
Masuyama, Masaru; Takemae, Yoshihiro; Endoh, Tetsuhiko; Komyoji, Hirosuke; Tanaka, Ryuji; and Itakura, Katsuhiko, 5,025,415, Cl. 365-52.000.

Engebretson, A. Maynard, to Storz Instrument Company. Method of readout of implanted hearing aid device and apparatus therefor. 5,024,224, Cl. 128-420.600.

Engelhard Corporation: *See—*
Speronello, Barry K.; Byrne, John W.; and Chen, James M., 5,024,981, Cl. 502-67.000.

Engelhardt, Dietmar: *See—*
Grecksch, Hans; and Engelhardt, Dietmar, 5,024,389, Cl. 242-35.50A.

Engelmann, Theodore R.: *See—*
Mason, Charles D.; Sacks, William; Engelmann, Theodore R.; and Verma, Satyajit, 5,024,897, Cl. 428-474.400.

Engelsberg, Audrey C. Removal of surface contaminants by irradiation from a high-energy source. 5,024,968, Cl. 437-173.000.

Engler, Bernd: *See—*
Koberstein, Edgar; Engler, Bernd; Domesle, Rainer; and Schubert, Peter, 5,024,985, Cl. 502-304.000.

Engler, Heidrun: *See—*
Ahrens, Kurt H.; Schickaneder, Helmut; Engler, Heidrun; and Szeleny, Istvan, 5,025,016, Cl. 514-274.000.

Enomoto, Katashi: *See—*
Itoh, Hisato; Enomoto, Katashi; Oguchi, Takahisa; and Nishizawa, Tsutomu, 5,024,926, Cl. 430-495.000.

Envirolite Products, Inc.: *See—*
Curiel, Ray, 5,024,904, Cl. 429-27.000.

Enya, Takeshi: *See—*
Tanaka, Hiroaki; Enya, Takeshi; and Nakamura, Katsumi, 5,024,101, Cl. 73-766.000.

Enzo Biochem, Inc.: *See—*
Yang, Huey-Lang; Todd, John; and Jou, Huey-Ling L., 5,024,933, Cl. 435-6.000.

Epstein, William E. Flexibility enhancement multi-machine carousel. 5,024,175, Cl. 112-217.200.

Erickson, Donald C. Branched gax absorption vapor compressor. 5,024,063, Cl. 62-101.000.

Ernst Leitz Wetzlar, GmbH: *See—*
Durig, Urs T.; Fischer, Ulrich C.; and Pohl, Wolfgang D., 5,025,147, Cl. 250-216.000.

Espaillac, Marcellin: *See—*
Giuliani, Pierre; Le Page, Jean-Francois; Plumail, Jean-Claude; and Espaillac, Marcellin, 5,024,751, Cl. 208-108.000.

Espinosa, Medardo: *See—*
Watts, Leonard A.; and Espinosa, Medardo, 5,024,569, Cl. 414-790.300.

Estrada, hayden F.: *See—*
Pitts, Warren R.; Estrada, hayden F.; and West, Peter, 5,024,898, Cl. 428-511.000.

Etat Francais represente par le Ministre: *See—*
Landreau, Jean; and Nakajima, Hisao, 5,024,853, Cl. 427-10.000.

Etcheparre, Jean; and Etchparre, Bernard, to Lectra Systemes S.A. Method and apparatus for piling plural sheets of material having a repetitive pattern thereon, while ensuring the vertical alignment of the patterns from one sheet to the next. 5,024,429, Cl. 270-30.000.

Etchparre, Bernard: *See—*
Etcheparre, Jean; and Etchparre, Bernard, 5,024,429, Cl. 270-30.000.

Ethicon, Inc.: *See—*
Berry, John P., 5,024,789, Cl. 264-6.000.

Ethyl Corporation: *See—*
Beaver, Phillip R., 5,025,110, Cl. 570-206.000.
Chang, Suae-Chen, 5,024,860, Cl. 427-230.000.
Hanlon, J. Vincent; and Culley, Scott A., 5,024,775, Cl. 252-52.00R.
Smith, Kim R.; and Borland, James E., 5,024,777, Cl. 252-117.000.
Torres, James E., 5,025,050, Cl. 524-91.000.

Etoh, Yoshiyuki; Inoue, Hiroshi; Mori, Kazuyuki; Suzuki, Koichi; Nakano, Kinichiro; Nomura, Hiroyuki; Yamamoto, Isao; and Yoshida, Kiyoshi, to Nissan Motor Company, Limited. System and method for automatically controlling vehicle speed to desired cruise speed using microcomputer. 5,025,379, Cl. 364-426.040.

Euroflex, S.A.: *See—*
Mulvey, Philip, 5,024,419, Cl. 251-148.000.

Evans, Francis J.; Jones, Ralph W., Jr.; and Wilson, Robert D., to Eastman Kodak Company. Photographic emulsions sensitized by the introduction of oligomers. 5,024,931, Cl. 430-567.000.

Evans, Steven: *See—*
Chapman, Derek D.; and Evans, Steven, 5,024,990, Cl. 503-227.000.

Everfilt Corporation: *See—*
Chiarito, Richard J., 5,024,771, Cl. 210-791.000.

Exfluor Research Corporation: *See—*
Lagow, Richard J.; Bierschenk, Thomas R.; Juhlke, Timothy J.; and Kawa, Hajimu M., 5,025,093, Cl. 568-601.000.

Extrusion Services, Inc.: *See—*
Hays, Donald F., Jr., 5,024,130, Cl. 83-444.000.

Exxon Research & Engineering Company: *See—*
Gorun, Sergiu M.; and Stibrany, Robert T., 5,025,101, Cl. 556-50.000.

Eylon, Daniel: *See—*
Froes, Francis H.; and Eylon, Daniel, 5,024,369, Cl. 228-157.000.

Faarup, Peter: *See—*
Gronwald, Frederik; Andersen, Peter H.; Faarup, Peter; Guddal, Erling; Hansen, Kristian T.; Hansen, Louis B.; and Nielsen, Erik B., 5,025,009, Cl. 514-213.000.

Faden, Alan I., to Medicis Corporation. Central nervous system injury treatment with opiate-receptor antagonist. 5,025,018, Cl. 514-277.000.

Fairfield Manufacturing Company, Inc.: *See—*
Phebus, Dan E.; Schrader, William A.; and Summers, Russell E., Jr., 5,024,636, Cl. 475-141.000.

Falk, R. A., to Boeing Company, The. Optical and gate for use in a cross-bar arithmetic/logic unit. 5,024,499, Cl. 350-96.110.

Fallon, Hugh C.: *See—*
Dinan, Raymond F.; Fallon, Hugh C.; Malin, Jerald R.; Rodite, Robert R.; Rohe, Clair F.; and Rohrer, Gene D., 5,025,483, Cl. 382-58.000.

Fang, William. Personal health monitor enclosure. 5,024,225, Cl. 128-630.000.

Fanta, Thomas O.; and Chabala, Leonard V., to S&C Electric Company. Method and arrangement for providing power operation of switchgear apparatus. 5,025,171, Cl. 307-150.000.

Fantozzi, Louis R.; Kessler, Lawrence; and Draxler, Richard, to Fantozzi, Louis R.; and Kessler, Lawrence. Compact infrared lens arrangement including at least three reflections. 5,024,493, Cl. 350-1.300.

Fanuc Ltd.: *See—*
Seki, Masaki; Takegahara, Takashi; and Nakajima, Masatoshi, 5,025,363, Cl. 364-191.000.

Fanuc Ltd: *See—*
Kurakake, Mitsuo; and Kinoshita, Jiro, 5,025,200, Cl. 318-569.000.

Farkas, Otto : *See—*
Fejerdy, Istvan; Farkas, Otto ; and Havasi, Gabor, 5,024,424, Cl. 267-64.270.

Farmer, Charles, to Advanced Micro Devices, Inc. Apparatus for generating digital gating signals in response to a digital data signal. 5,025,181, Cl. 307-571.000.

Farmer, Charles, to Advanced Micro Devices, Inc. Digital apparatus for generating gating signals in response to a data signal. 5,025,182, Cl. 307-571.000.

Faroudja, Yves C. Motion-adaptive video noise reduction system using recirculation and coring. 5,025,312, Cl. 358-36.000.

Farrar, John M.; and Graham, Mark D., to Sandoz Ltd. Detergent compositions containing an anionic surfactant and a 4,4'-bis(-triazinylamino)-stilbene disulphonic acid optical brightener. 5,024,786, Cl. 252-543.000.

Faulkner, W. Harrison, III; and Colton, Douglas E., to Slautterback Corporation. Contact-free method of forming sift-proof seals. 5,024,709, Cl. 156-69.000.

Fay, Gary V.; Robb, Stephen P.; Sutor, Judith L.; and Terry, Lewis E., to Motorola, Inc. Semiconductor structure with closely coupled substrate temperature sense element. 5,025,298, Cl. 357-41.000.

Fazio, Luigi: *See—*
Vaschetto, Lorenzo; and Fazio, Luigi, 5,024,383, Cl. 239-284.100.

Federal-Mogul Corporation: *See—*
Nash, Stephen E., 5,024,364, Cl. 277-35.000.
Tienken, Alfred G., 5,025,350, Cl. 362-61.000.

Feinberg, Howard A.; and Rees, Theodore D., to R-Byte, Inc. Tape engagement mechanism for magnetic cassette tape. 5,025,333, Cl. 360-85.000.

Fejerdy, Istvan; Farkas, Otto ; and Havasi, Gabor, to TAURUS Gumiipari Vallalat. Air-spring, in particular for the use under extreme conditions. 5,024,424, Cl. 267-64.270.

Feldman, Martin: *See—*
Chen, Chin-Chen; Feldman, Martin; and Waggener, Herbert A., 5,025,165, Cl. 250-491.100.

Feldman, Steven: *See—*
Dola, Frank P.; Feldman, Steven; Lauterbach, John H.; and Mengelson, William G., 5,024,614, Cl. 439-114.000.

Feldmuehle Aktiengesellschaft: *See—*
Friederich, Kilian; and Rogowski, Dirk, 5,024,977, Cl. 501-91.000.

Feldschuh, Jonathan A.: *See—*
Feldschuh, Joseph; and Feldschuh, Jonathan A., 5,024,231, Cl. 128-654.000.

Feldschuh, Joseph; and Feldschuh, Jonathan A., to Daxor Corporation. Automated multi-point blood volume analyzer. 5,024,231, Cl. 128-654.000.

Felo-Werkzeugfabrik: *See—*
Holland-Letz, Horst; and Bubel, Rainer, 5,024,126, Cl. 81-489.000.

Felton, George F.: *See—*
Landers, Perry E.; and Felton, George F., 5,024,697, Cl. 106-14.130.

Fendley, James R., to Zenith Electronics Corporation. Adjustable-height shadow mask support for a flat tension mask color cathode ray tube. 5,025,191, Cl. 313-407.000.

Fengelly, Raymond S., to Grumman Aerospace Corporation. Method for manufacturing a high-performance package for monolithic microwave integrated circuits. 5,023,993, Cl. 29-843.000.

Fennell, Robert D.: *See—*
DeLuca, Michael J.; Snowden, Gregory O.; and Fennell, Robert D., 5,025,252, Cl. 340-825.440.

Fenwick, Lawrence M. Magnetic key chain. 5,024,078, Cl. 70-456.00R.

Ferguson, Vivian, to Automated Machinery Systems, Inc. Airbag stitching device. 5,024,174, Cl. 112-121.240.

Fernando, John S.: *See—*
Mathur, Sanjay S.; and Fernando, John S., 5,025,365, Cl. 364-200.000.

Ferrand, Robert, to American Life Support Technology. Patient support system. 5,023,967, Cl. 5-62.000.

Ferrari, Harry M.: *See—*
Snyder, Thomas S.; Jackovitz, John F.; and Ferrari, Harry M., 5,024,749, Cl. 204-299.00R.

Ferrigno, Michael R. Adjustable belt-attached fishing rod holder. 5,024,018, Cl. 43-21.200.

Ferro Corporation: *See—*
Sato, Yoshinori; and Akamine, Hiroshi, 5,025,051, Cl. 524-99.000.

Fiat Ferroviaria S.p.A.: *See—*
Panagin, Romano, 5,024,165, Cl. 105-168.000.

Fikentscher, Rolf: *See—*
Oftring, Alfred; Birnbach, Stefan; Fikentscher, Rolf; Baur, Richard; Kud, Alexander; Goeckel, Ulrich; and Perner, Johannes, 5,025,103, Cl. 560-170.000.

Filby, Evan E.; and Rankin, Richard A., to United States of America, Energy. Expert overseer for mass spectrometer system. 5,025,391, Cl. 364-513.000.

Filliatre, Claude: *See—*
Debaig-Valade, Caroline; Filliatre, Claude; and Servens, Christian, 5,024,979, Cl. 501-95.000.

Finn, Everett N.: *See—*
Lowe, Byron L.; Lewis, Robert T.; Milliner, Kenneth M.; and Finn, Everett N., 5,024,351, Cl. 221-277.000.

Finn, Leslie E.; Swatling, Donald K.; and Mankin, Erle D., to Clorox Company, The. Zeolite agglomeration process and product. 5,024,782, Cl. 252-174.130.

Fischer, Ernst: *See—*
Dreier, Friedrich; and Fischer, Ernst, 5,024,540, Cl. 384-203.000.

Fischer, Gerhard: *See—*
Klock, Jurgen; Fischer, Gerhard; and Grubisic, Vatroslav, 5,024,102, Cl. 73-798.000.

Fischer, Kathy J.: *See—*
Thurman, Laurance R.; Dowd, Joseph P.; and Fischer, Kathy J., 5,024,772, Cl. 252-1.000.

Fischer, Kurt; and Louys, Georges, to Georg Fischer AG. Molding apparatus. 5,024,161, Cl. 164-149.000.

Fischer, Roland: *See—*
Meyer, Urs; Gartenmann, Niklaus; and Fischer, Roland, 5,023,976, Cl. 19-0.250.

Fischer, Ulrich C.: *See—*
Durig, Urs T.; Fischer, Ulrich C.; and Pohl, Wolfgang D., 5,025,147, Cl. 250-216.000.

Fishler, Mark K.; Koten, Jean-Marie; and Dubois, Pascal, to Vesuvius Crucible Company. One-piece stopper rod. 5,024,422, Cl. 266-272.000.

Fitzgerald, Lawrence T.: *See—*
Bova, Frank J.; Fitzgerald, Lawrence T.; and Mauderli, Walter, 5,025,376, Cl. 364-413.260.

Flaim, Tony D.: *See—*
Moss, Mary G.; Brewer, Terry; Cuzmar, Ruth M.; Hawley, Dan W.; and Flaim, Tony D., 5,024,922, Cl. 430-330.000.

Flakee Mills, Inc.: *See—*
Bailey, Richard G., 5,024,145, Cl. 99-451.000.

Flanagan, John R.: *See—*
Casper, Daniel F.; Flanagan, John R.; Gregg, Thomas A.; Huang, Catherine C.; and Kalos, Matthew J., 5,025,458, Cl. 375-114.000.

Flanigan, David A.: *See—*
Canterberry, J. B.; and Flanigan, David A., 5,024,160, Cl. 102-323.000.

Flasck, Richard A., to RAF Electronics Corp. Reflective image plane module. 5,024,524, Cl. 353-31.000.

Flaugher, Jill L.: *See—*
Altman, Leonard F.; Flaugher, Jill L.; Suppelsa, Anthony B.; and Mullen, William B., III, 5,024,372, Cl. 228-248.000.

Flautt, Martin C.: *See—*
Pollet, Jean C.; Williams, Gary L.; Armstrong, Gordon P.; and Flautt, Martin C., 5,024,890, Cl. 428-372.000.

Fleet, George W. J., to Monsanto Company. Method of preparing bicyclic tetrahydroxylated pyrrolizidines. 5,025,098, Cl. 548-453.000.

Flores, James F.: *See—*
Dominguez, Danilo A.; and Flores, James F., 5,024,567, Cl. 410-100.000.

Flowers, Joyce D. Supply caddy. 5,024,361, Cl. 224-223.000.

Floyd, Robert A.: *See—*
Carney, John M.; and Floyd, Robert A., 5,025,032, Cl. 514-400.000.

Fluent, Stewart L.; Hart, Colin; McCree, Charles D.; and Lotsch, Charles F., to CertainTeed Corporation. Panel packaging system. 5,024,045, Cl. 53-443.000.

FME Corporation: *See—*
Haines, John G.; Rosenbaum, Nolan G.; Pion, Albert L.; Lecarpentier, Marc; Henriot, Christophe; and Abumehdi, Cyrus, 5,025,383, Cl. 364-464.030.

Focke & Co., GmbH: *See—*
Focke, Heinz, 5,024,376, Cl. 229-160.100.

Focke, Heinz, to Focke & Co., GmbH. Web of material consisting of (pack) blanks connected to one another. 5,024,376, Cl. 229-160.100.

Fontana, Luca P.; and Buckley, Paul W., to General Electric Company. Preparation of polyestercarbonate from aliphatic dicarboxylic acid. 5,025,081, Cl. 528-176.000.

Fontes, Michael: *See—*
Gould, Nathaniel; Fontes, Michael; and Thessin, Tyler R., 5,025,476, Cl. 382-2.000.

Ford, Douglas L.; Anderson, Eric W.; and Kopp, Clinton V., to Memtec Limited. Concentration of solids in a suspension. 5,024,762, Cl. 210-321.690.

Ford Motor Company: *See—*
Colvin, Alex D.; Graham, Daniel J.; and Cassatta, Joseph C., 5,025,220, Cl. 324-449.000.
Cook, Robert H., 5,024,301, Cl. 188-284.000.

Ford New Holland, Inc.: *See—*
Glass, Emmett F.; Schoeneberger, Ernest A.; and Makofka, Stanley J., 5,024,051, Cl. 56-297.000.

Forestier, Serge: *See—*
Canivenc, Edith; Forestier, Serge; Gay, Michel; Lang, Gerard; and Richard, Herve, 5,025,053, Cl. 524-265.000.

Fortmann, Robert C.; Pinnow, Curtis C.; Kuschewski, Gustav; and Joseph, William A., Jr., to Carter-Hoffman Corporation. Microprocessor controlled food treatment cabinet with flash steamer and compensating humidity control routines. 5,025,132, Cl. 219-401.000.

Fosler, Carl R.: *See—*
Keyser, George T., Jr.; Fosler, Carl R.; and Johnson, Jeffrey D., 5,025,373, Cl. 364-408.000.

Foucher, Gerard, to GEC Alsthom SA. Devices for reducing deflection and stress in turbine diaphragms. 5,024,581, Cl. 415-191.000.

Fox, Charles: *See—*
Gershon, Sol; Fox, Charles; and Garfinkle, Norton, 5,024,855, Cl. 424-52.000.

Fox, Flo, to Weiss, Peter. Elongated article of apparel. 5,023,956, Cl. 2-338.000.

Francis, Charles E., to Gassett, John D., a part interest. Strengthening door jamb. 5,024,475, Cl. 292-340.000.

Frane, Terrie L., to Motorola, Inc. Power saving arrangement for a clocked digital circuit. 5,025,387, Cl. 364-493.000.

Frank, Ed, to Boeing Company, The. Automated cutting and kitting system of composite material and method. 5,024,862, Cl. 427-264.000.

Franka, John G.: *See—*
DePinto, Gary A.; Steinberg, Joe; Franka, John G.; and Cherniawski, Michael R., 5,024,972, Cl. 437-233.000.

Franzen, Peter: *See—*
Inge, Claes; Franzen, Peter; Lagerstedt, Torgny; Borgstrom, Leonard; Carlsson, Claes-Goran; Moberg, Hans; and Näbo, Olle, 5,024,648, Cl. 494-56.000.

Fraunhofer-Gesellschaft: *See—*
Klock, Jurgen; Fischer, Gerhard; and Grubisic, Vatroslav, 5,024,102, Cl. 73-798.000.

Frawley, Thomas E., Jr., to Appleton Specialty Products, Inc. Flow meter for liquid doctored through Fourdrinier fabric at wet end of Fourdrinier paper machine. 5,024,084, Cl. 73-215.000.

Free, Paul D.; Doszpoly, B.; Villanyi, Tibor J.; and Olson, David A., to Cummins Engine Company, Inc. Viscosity responsive pressure regulator and timing control tappet system incorporating the same. 5,024,200, Cl. 123-501.000.

Freeman, Andrew B.; and Hein, H. A. Tillmann. Epidural catheter apparatus and associated method. 5,024,655, Cl. 604-53.000.

Freeport McMoRan Resource Partners: *See—*
Sutton, Allen R.; and Balser, Richard L., 5,024,689, Cl. 71-29.000.

Freitag, Dieter: *See—*
Tacke, Peter; Grigo, Ulrich; Nouvertne, Werner; Freitag, Dieter; Idel, Karsten-Josef; and Westeppe, Uwe, 5,025,065, Cl. 524-611.000.

Freitas, Oscar W., to National Semiconductor Corporation. ECL clamped cutoff driver circuit. 5,025,179, Cl. 307-455.000.

Fremont Industries, Inc.: *See—*
Busch, Bruce D.; and Nicholls, Jeffrey R., 5,024,783, Cl. 252-180.000.

French, Jay L.; Himes, John L., Jr.; Weber, Ronald M.; and Wise, James H., to AMP Incorporated. Low profile spring contact with protective guard means. 5,024,610, Cl. 439-857.000.

Freund, Isaac; and Rosenbluh, Michael, to Bar Ilan University. Alignment apparatus employing a laser light scatterer. 5,024,528, Cl. 356-356.000.

Frey, Wunibald: *See—*
Doege, Mathias; and Frey, Wunibald, 5,025,136, Cl. 219-508.000.

Friebe, Walter-Gunar: *See—*
Reinholz, Erhard; Friebe, Walter-Gunar; Kampe, Wolfgang; Mertin, Jurgen; and Wilhelms, Otto-Henning, 5,025,028, Cl. 514-381.000.

Friederich, Kilian; and Rogowski, Dirk, to Feldmuehle Aktiengesellschaft. Combination of two sliding or sealing elements and a method for producing the same. 5,024,977, Cl. 501-91.000.

Friedrich, Steven G.; and Davis, Kent A., to W. R. Grace & Co.-Conn. Process for producing an easily opened package. 5,024,044, Cl. 53-433.000.

Friske, Mark S.: *See*—
Allaire, Roger A.; Friske, Mark S.; Hagg, Sandra L.; and Janas, Victor F., 5,024,978, Cl. 501-95.000.

Fritsch, Josef: *See*—
Urban, Rudolf; Fritsch, Josef; and Schoen, Klaus-Peter, 5,024,041, Cl. 53-449.000.

Froes, Francis H.; and Eylon, Daniel, to United States of America, Air Force. Method to produce superplastically formed titanium alloy components. 5,024,369, Cl. 228-157.000.

Fromageries Bel: *See*—
Litzler, Jean, 5,024,331, Cl. 206-551.000.

Froyd, Stanley G. Multiple axis motion control system. 5,025,385, Cl. 364-474.110.

Fuchs, Elmar B.: *See*—
Nigg, Ernst; and Fuchs, Elmar B., 5,024,162, Cl. 104-178.000.

Fucik, Borivoj; Petranek, Milan; and Smital, Frantisek, to Elitex Koncern Textiln. Needle picker releasing device. 5,024,068, Cl. 66-53.000.

Fuji Electric Co., Ltd.: *See*—
Miura, Masao; Uchida, Naoshi; Takahashi, Tatsunori; Asakawa, Kouji; and Nozawa, Eiji, 5,025,236, Cl. 335-46.000.
Seki, Yasukazu, 5,025,293, Cl. 357-23.400.

Fuji Film Co., Ltd.: *See*—
Katsuaki, Muraishi, 5,025,157, Cl. 250-327.200.

Fuji Jukogyo Kabshiki Kaisha: *See*—
Nakamura, Akihisa, 5,024,197, Cl. 123-339.000.

Fuji Jukogyo Kabushiki Kaisha: *See*—
Abe, Kunihiro, 5,024,199, Cl. 123-489.000.
Abe, Kunihiro, 5,025,259, Cl. 341-118.000.

Fuji Photo Film Co., Ltd.: *See*—
Deguchi, Naoyasu, 5,024,925, Cl. 430-379.000.
Endo, Yasushi; Kato, Mikihiko; Kawamata, Toshio; and Masaki, Kouichi, 5,024,885, Cl. 428-329.000.
Mutoh, Hideki; Oda, Kazuya; and Kawajiri, Kazuhiro, 5,025,319, Cl. 358-213.290.
Nakamura, Hiroaki; and Takagi, Atsushi, 5,025,282, Cl. 355-38.000.
Naruse, Hideaki; Takahashi, Osamu; Ohki, Nobutaka; and Ono, Michio, 5,024,924, Cl. 430-376.000.
Ohgoda, Makoto, 5,025,156, Cl. 250-327.200.
Suzuki, Yoshiaki; and Hayashi, Gouichi, 5,024,923, Cl. 430-372.000.
Watanabe, Hideomi; and Okita, Tsutomu, 5,024,892, Cl. 428-423.100.

Fuji Xerox Co., Ltd.: *See*—
Akasaki, Yutaka; Aonuma, Hidekazu; Nukada, Katsumi; Tokita, Akihiko; Suto, Hidemi; Sato, Katsuhiro; and Tanaka, Hiroyuki, 5,024,911, Cl. 430-58.000.

Fujie, Naofumi; Imaizumi, Tomoaki; Ito, Koji; and Okada, Shoji, to Aisin Seiki Kabushiki Kaisha. Actuator and control system for cleaning of mirror-like objects. 5,025,187, Cl. 310-323.000.

Fujii, Hiroyuki: *See*—
Suganuma, Katsuaki; Fujii, Hiroyuki; Minakuchi, Hiroyoshi; Kada, Katsuhiko; Osafune, Haruo; and Kanamaru, Kuniaki, 5,024,902, Cl. 428-633.000.

Fujii, Katsuyoshi: *See*—
Nakanishi, Masahiro; Mori, Daisuke; Fujii, Katsuyoshi; Hatanaka, Masahiko; and Shinada, Hiroko, 5,024,133, Cl. 84-615.000.

Fujikawa, Yoshihiro; Suzuki, Mikio; Iwasaki, Hiroshi; Sakashita, Mitsuaki; and Kirahara, Masaki, to Nissan Chemical Industries Ltd. Pyrazolopyridine type mevalonolactones useful as pharmaceuticals. 5,024,999, Cl. 514-63.000.

Fujikura Ltd.: *See*—
Oohashi, Keiji; Araki, Shinji; Suzuki, Hideo; and Shimomichi, Tsuyoshi, 5,024,688, Cl. 65-3.120.
Suda, Hirohisa; Sasaki, Katsumi; and Osato, Yasukuni, 5,024,363, Cl. 225-96.005.
Taya, Hiroyuki; Yoshinuma, Mikio; Yamada, Takeshi; Nishide, Kenji; Suzuki, Fumio; Fujimoto, Hirohisa; and Yamauchi, Ryozo, 5,024,501, Cl. 350-96.150.

Fujimoto, Hirohisa: *See*—
Taya, Hiroyuki; Yoshinuma, Mikio; Yamada, Takeshi; Nishide, Kenji; Suzuki, Fumio; Fujimoto, Hirohisa; and Yamauchi, Ryozo, 5,024,501, Cl. 350-96.150.

Fujimoto, Seiji: *See*—
Saito, Yasuo; Fujimoto, Seiji; Nobuta, Yasuo; and Yamazaki, Masahiko, 5,025,462, Cl. 378-19.000.

Fujimura, Shuzo, to Fujitsu Limited. Microwave plasma processing apparatus. 5,024,748, Cl. 204-298.380.

Fujino, Toshihiro: *See*—
Ohashi, Yasusuke; Fujino, Toshihiro; Taki, Yasuhito; and Nishijima, Tamotsu, 5,024,815, Cl. 420-487.000.

Fujisawa Pharmaceutical Co., Ltd.: *See*—
Osamu, Nakaguchi, 5,025,026, Cl. 514-356.000.

Fujita, Nagahisa, to Mazda Motor Corporation. Slippage preventing apparatus for a vehicle. 5,024,285, Cl. 180-197.000.

Fujita, Yoshikuni; and Matsuo, Haruyuki, to Mitsubishi Denki Kabushiki Kaisha. Ignition distributor of internal combustion engine. 5,024,185, Cl. 123-146.50A.

Fujitsu Limited: *See*—
Ema, Taiji, 5,025,294, Cl. 357-23.600.
Fujimura, Shuzo, 5,024,748, Cl. 204-298.380.
Goto, Gensuke, 5,025,409, Cl. 364-786.000.
Kiriseko, Tadashi; Tani, Hiromichi; Soma, Noriko; Shigemi, Nobuhisa; and Toyoda, Takayuki, 5,024,570, Cl. 414-222.000.
Masuyama, Masaru; Takemae, Yoshihiro; Endoh, Tetsuhiko; Komyoji, Hirosuke; Tanaka, Ryuji; and Itakura, Katsuhiko, 5,025,415, Cl. 365-52.000.
Natori, Katsuhide; Watanabe, Isao; Katsuyama, Koji; Kawamura, Isao; Yamamoto, Karuhiko; and Nagai, Takeshi, 5,024,264, Cl. 165-1.000.
Nishimiya, Takeshi, 5,025,330, Cl. 360-78.040.
Takeno, Minoru, 5,025,176, Cl. 307-351.000.

Fujitsu Vlsi Limited: *See*—
Masuyama, Masaru; Takemae, Yoshihiro; Endoh, Tetsuhiko; Komyoji, Hirosuke; Tanaka, Ryuji; and Itakura, Katsuhiko, 5,025,415, Cl. 365-52.000.

Fujiwara, Masatoshi, to Mitsubishi Denki Kabushiki Kaisha. Method for producing a λ/4 shift type diffraction grating. 5,024,726, Cl. 156-653.000.

Fukami, Toshiyuki: *See*—
Yoshida, Takeshi; Nakatani, Kaname; Fukami, Toshiyuki; and Tanaka, Nariaki, 5,024,913, Cl. 430-67.000.

Fukazawa, Toshio: *See*—
Nagata, Yuji; and Fukazawa, Toshio, 5,025,342, Cl. 360-126.000.

Fukuda, Mitsuhiro: *See*—
Yabuta, Motoshi; Nakao, Yasushi; Sugiura, Shinji; Fukuda, Mitsuhiro; and Miyamoto, Yuzo, 5,025,060, Cl. 524-533.000.

Fukuda, Toshikazu: *See*—
Tomisawa, Yutaka; Fukuda, Toshikazu; and Inoue, Kazuhiko, 5,025,305, Cl. 357-72.000.

Fukui, Tetsu; Yoshii, Takashi; Takemura, Toshihiko; and Hattori, Akio, to Kubota, Ltd. Propelling drive control apparatus for working vehicle. 5,024,306, Cl. 192-3.570.

Fukumoto, Masayuki: *See*—
Abe, Tsutomu; and Fukumoto, Masayuki, 5,024,946, Cl. 435-240.270.

Fullerton, Craig L.; and Seely, Warren L., to Motorola, Inc. Center tapped FET. 5,025,296, Cl. 357-23.800.

Fuma, Hiroshi: *See*—
Shoji, Hisashi; Tamura, Akihiko; Itaya, Masahiko; Fuma, Hiroshi; and Soma, Shinobu, 5,024,181, Cl. 118-658.000.

Funabashi, Motohisa: *See*—
Inoue, Haruki; Funabashi, Motohisa; Yahiro, Masakazu; and Tanaka, Fumiki, 5,025,499, Cl. 364-165.000.

Funabashi, Tadashi; and Kenmotsu, Isami, to Pioneer Electronic Corporation. Dual side disc player having a pickup reversing mechanism. 5,025,440, Cl. 369-199.000.

Funamoto, Masaya: *See*—
Yoshimoto, Satoshi; and Funamoto, Masaya, 5,024,545, Cl. 400-696.000.

Funato, Ryo; Takahiro, Syuji; Yoshida, Keiji; Kubo, Shinji; and Inagaki, Motoshi, to Mitsubishi Rayon Company Limited. Resin for toner particle. 5,024,914, Cl. 430-109.000.

Funke, Hermann: *See*—
Dinter, Peter; Funke, Hermann; and Matschke, Klaus, 5,024,819, Cl. 422-186.060.

Furay, David M.: *See*—
Morehouse, James H.; Furay, David M.; Blagaila, John; Dion, F. Eugene; Shelstad, Scott A.; and Woods, Jimmy L., 5,025,336, Cl. 360-97.020.

Furlough, Thomas D., to Long Manufacturing N.C., Inc. Reversible moldboard plow. 5,024,281, Cl. 172-219.000.

Furukawa Electric Co., Ltd., The: *See*—
Senoo, Atsuyoshi, 5,025,058, Cl. 524-436.000.

Furukawa, Masataka: *See*—
Morita, Tsuyoshi; Shimazu, Kyotaro; and Furukawa, Masataka, 5,024,728, Cl. 159-27.400.

Furuya, Masato: *See*—
Takanashi, Itsuo; Nakagaki, Shintaro; Shinonaga, Hirohiko; Asakura, Tsutou; Furuya, Masato; and Tai, Hiromichi, 5,025,209, Cl. 324-96.000.

Fuschetto, Anthony N., to United States of America, Air Force. Electromagnetic actuator driver apparatus with pivot axis. 5,025,183, Cl. 310-20.000.

Futatasuka, Rensei; Koshiba, Yutaka; Chiba, Shunich; Orikasa, Toyoaki; Noguchi, Seiji; and Idoshita, Takuya, to Mitsubishi Shindoh Co., Ltd. Copper alloy having excellent hot rollability and excellent adhesion strength of plated surface thereof when heated. 5,024,814, Cl. 420-473.000.

G.D. Societa Per Azioni: *See*—
Draghetti, Fiorenzo; and Gamberini, Antonio, 5,024,043, Cl. 53-234.000.
Spatafora, Mario; and Gamberini, Antonio, 5,024,046, Cl. 53-466.000.

Gaba, Rodolfo: *See*—
Sandel, Dan; Horan, Robert T.; Gaba, Rodolfo; and Ramirez, Bruno J., 5,024,326, Cl. 206-366.000.

GAF Chemicals Corporation: *See*—
Helioff, Michael W.; Tazi, Mohammed; Kwak, Yoon T.; and Login, Robert B., 5,024,779, Cl. 252-162.000.

Gage, Douglas M., to Deere & Company. Hydraulic control mechanism for a hydraulic actuator. 5,024,140, Cl. 91-28.000.

Gailey, J. Lynn, to Alcan Aluminum Corporation. Non-directional suspended ceiling panels. 5,024,034, Cl. 52-484.000.

Gallup, Darrell L., to Union Oil Company of California. Method of treating an arsenic-containing solution. 5,024,769, Cl. 210-721.000.

Gamberini, Antonio: *See*—
Draghetti, Fiorenzo; and Gamberini, Antonio, 5,024,043, Cl. 53-234.000.

Spatafora, Mario; and Gamberini, Antonio, 5,024,046, Cl. 53-466.000.

Gambini, Tiziana: *See—*
Prelini, Cesare; Trovati, Aldo; Gambini, Tiziana; and Stefanoli, Vittorio, 5,024,674, Cl. 8-554.000.

Gambro AB: *See—*
Sternby, Jan P., 5,024,756, Cl. 210-93.000.

Ganser, Hans G.; Schafer, Ralf; and Stormberg, Hans P., to U.S. Philips Corporation. Circuit arrangement for A.C. operation of high-pressure gas discharge lamps. 5,025,197, Cl. 315-172.000.

Ganster, Otto: *See—*
Neuhaus, Alfred; Ganster, Otto; and Kopp, Richard, 5,025,039, Cl. 521-51.000.

Garcia, Felix: *See—*
Williams, Rodney D.; and Garcia, Felix, 5,024,494, Cl. 350-3.600.

Garcia, Gilbert; and Domnikov, Larissa, to Hughes Aircraft Company. Reacting novolac and bisphenol F epoxy resins with carboxy-terminated butadiene-acrylonitrile. 5,025,068, Cl. 525-119.000.

Gardner, Juilian W.: *See—*
Brink, Andre; Cahill, Michael J.; Dawson, John; Gardner, Juilian W.; and Thierry, Alan A., 5,024,333, Cl. 209-535.000.

Garfinkle, Norton: *See—*
Gershon, Sol; Fox, Charles; and Garfinkle, Norton, 5,024,855, Cl. 424-52.000.

Garg, Diwakar; Dyer, Paul N.; Schaffer, Leslie E.; Wrecsics, Ernest L.; Dimos, Duane; and Mueller, Carl F., to Air Products and Chemicals, Inc. Method for depositing highly erosive and abrasive wear resistant composite coating system on a substrate. 5,024,901, Cl. 428-627.000.

Garlock Inc.: *See—*
Borowski, Richard, 5,024,451, Cl. 277-53.000.

Gartenmann, Niklaus: *See—*
Meyer, Urs; Gartenmann, Niklaus; and Fischer, Roland, 5,023,976, Cl. 19-0.250.

Garthaffner, Martin T.; Keen, Billy J., Jr.; Gillespie, Andrew J.; Wheless, Jack C.; and Dingus, George W., to Philip Morris Incorporated. Methods and apparatus for making multiple component smoking articles. 5,024,242, Cl. 131-94.000.

Gartner, Charles D.: *See—*
Relenyi, Attila G.; and Gartner, Charles D., 5,025,038, Cl. 514-665.000.

Gasaway, Jack S.; Parsons, J. Stuart; and Harshman, Robert L., to Injet Medical Products, Inc. Gas-pressure-regulated needleless injection system. 5,024,656, Cl. 604-70.000.

Gaspard, Jean R., to Pechiney Recherche. Apparatus and method continuous measurement of the electrical conductivity of liquid media in a dynamic cell. 5,025,219, Cl. 324-447.000.

Gasser, Oswald; Guggenberger, Rainer; and Burger, Bernd, to Thera. Method for preparing a substrate surface for bonding with a synthetic resin by applying a layer by sand blasting. 5,024,711, Cl. 156-153.000.

Gassett, John D.: *See—*
Francis, Charles E., 5,024,475, Cl. 292-340.000.

Gast, Eduard; and Semmler, Peter, to Contec Chemieanlagen GmbH. Castable and/or pressable gas generating propellants. 5,024,708, Cl. 149-19.100.

Gates, Peter S.; and Jones, Graham P., to Schering Agrochemicals Ltd. Herbicides. 5,024,693, Cl. 71-92.000.

Gatza, Ward K.; and Chasteen, Ronald E., to Injection Research Specialists, Inc. Method and apparatus for conserving battery power in a snowmobile electrical system. 5,024,205, Cl. 123-632.000.

Gaudiana, Russell A.: *See—*
Chiang, Yunn H.; and Gaudiana, Russell A., 5,024,989, Cl. 503-227.000.

Gauhl, Helmgard: *See—*
Mayr, Ulrich; Gauhl, Helmgard; and Seidel, Hans, 5,024,945, Cl. 435-191.000.

Gauthier, Dominique, to Thomson-LGT Laboratoire General des Telecommunications. Method for the measurement of a steady level in a noise-infested signal and automatic measuring device for the application of this method. 5,025,207, Cl. 324-77.00A.

Gawad, Mahmoud A., to GET Sylvania Canada Ltd. Small profile high wattage horticultural luminaire. 5,025,356, Cl. 362-221.000.

Gawin, Irena; and Swetlin, Brian J., to Hercules Incorporated. Damage tolerant composites containing infusible particles. 5,025,045, Cl. 523-440.000.

Gay, Michel: *See—*
Canivenc, Edith; Forestier, Serge; Gay, Michel; Lang, Gerard; and Richard, Herve, 5,025,053, Cl. 524-265.000.

Gear Fit Golf, Inc.: *See—*
Anderson, Donald A., 5,024,437, Cl. 273-78.000.

Gebrueder Buehler AG: *See—*
Gmur, Bruno; and Kuhnemund, Bernd, 5,024,352, Cl. 222-1.000.

GEC Alsthom SA: *See—*
Foucher, Gerard, 5,024,581, Cl. 415-191.000.

Geibel, Jon F.: *See—*
Bobsein, Rex L.; Stone, Mark L.; and Geibel, Jon F., 5,024,876, Cl. 428-272.000.

Geisen, Pierre; and Reillaudoux, Jean-Claude, to Soprema S.A. Sealing sheets for roofs. 5,024,886, Cl. 428-332.000.

Gels, Robert G.: *See—*
Tajima, Yusuke; and Gels, Robert G., 5,025,225, Cl. 330-124.00D.

Genda, Kohei; and Murai, Kazuaki, to Casio Computer Co., Ltd. Data processing apparatus including a delete function. 5,025,413, Cl. 364-900.000.

Genentech, Inc.: *See—*
Gorman, Cornelia M., 5,024,939, Cl. 435-69.100.

General Dynamics Corp., Pomona Div.: *See—*
Nunally, Patrick O., 5,025,178, Cl. 307-442.000.

General Electric Company: *See—*
Csongor, Rezso J.; and Tangradi, Leroy J., 5,025,485, Cl. 455-12.000.
Cusano, Dominic A.; and Yeager, Gary W., 5,024,791, Cl. 264-21.000.
Davis, Gary C.; McGrath, Barbara E.; and Snow, Kevin M., 5,025,074, Cl. 528-15.000.
Derudder, James L.; and Wang, I-Chung W., 5,025,066, Cl. 525-66.000.
Fontana, Luca P.; and Buckley, Paul W., 5,025,081, Cl. 528-176.000.
Germer, Warren R.; Coryea, Peter F.; Keturakis, Andrius A.; Masury, David H.; and Stevens, Thomas H., 5,025,206, Cl. 324-74.000.
Goodzeit, Neil E.; and Linder, David M., 5,025,381, Cl. 364-434.000.
Hamersma, Wilhelmus J. L. A.; Kempers, Torben P.; and Roovers, Wilhemus M. M., 5,025,055, Cl. 524-269.000.
Hartley, Richard I.; Corbett, Peter F.; Yassa, Fathy F.; and Noujaim, Sharbel E., 5,025,257, Cl. 341-101.000.
Lewis, Larry N.; and Sumpter, Chris A., 5,025,073, Cl. 528-15.000.
Millard, Michael L.; Harrison, Michael G.; and Szweda, Andrew, 5,024,859, Cl. 427-226.000.
Taylor, Dale F., 5,024,809, Cl. 376-417.000.

General Kinematics Corporation: *See—*
Musschoot, Albert, 5,024,320, Cl. 198-756.000.

General Mills, Inc.: *See—*
Ringe, Mitchell L., 5,024,996, Cl. 514-54.000.

General Motors Corporation: *See—*
Hanson, Reed D.; and Radcliffe, Scott T., 5,024,460, Cl. 280-707.000.
Miller, Jon E.; and Schenk, Donald E., 5,024,300, Cl. 188-264.0CC.
Santanam, Chandran B.; Thomas, William H.; and DeJulio, Emil R., 5,024,170, Cl. 110-264.000.
Schenk, Donald E.; DeHoff, Edward J.; and Shaw, Schuyler S., 5,024,298, Cl. 188-72.200.
Schmidt, Michael R., 5,024,633, Cl. 475-72.000.
Shaw, Schuyler S.; Hallinan, Linda L.; Hammersmith, Robert J.; Schenk, Donald E.; DeHoff, Edward J.; and Kade, Alexander, 5,024,299, Cl. 188-156.000.
Tibbetts, Gary G.; Gorkiewicz, Daniel W.; and Hammond, Dean C., Jr., 5,024,818, Cl. 422-158.000.
Vansadia, Ghanshyamsinh D., 5,024,578, Cl. 415-55.100.

General Signal Corporation: *See—*
Carr, Daniel J.; and Scally, Charles R., 5,025,265, Cl. 346-1.100.

Gentex Corporation: *See—*
Murphy, John A., II; and Westgate, Charles A., 5,023,955, Cl. 2-209.000.

Georg Fischer AG: *See—*
Fischer, Kurt; and Louys, Georges, 5,024,161, Cl. 164-149.000.

George, William A.: *See—*
Grossman, Mark W.; and George, William A., 5,024,738, Cl. 204-105.00R.

Gerard, Evelyne; Molle, Roger; and Debaisieux, Andre, to Compagnie d'Electronique et de Piezo-Electricite D.E.P.E. Ultrastable oscillator functioning at atmospheric pressure and under vacuum. 5,025,228, Cl. 331-69.000.

Gerling, Joseph F.; and Kaczmarczyk, Raymond A., Jr., to Du Pont de Nemours, E. I., and Company. Methods, systems, apparatus and rotor for applying granular material. 5,024,356, Cl. 222-312.000.

Germer, Warren R.; Coryea, Peter F.; Keturakis, Andrius A.; Masury, David H.; and Stevens, Thomas H., to General Electric Company. Test mode actuator and indicator for electronic energy meter. 5,025,206, Cl. 324-74.000.

Gero, William; and Paskowski, Frank, to Beloit Corporation. Method of manufacturing a wave screen plate. 5,023,986, Cl. 29-163.600.

Gershon, Sol; Fox, Charles; and Garfinkle, Norton, to Cambridge Research Laboratories, Inc. Oral rinse and method for plaque removal. 5,024,855, Cl. 424-52.000.

Gesche, Roland; and Vey, Norbert, to Leybold Aktiengesellschaft. Circuit configuration for the recognition of a plasma. 5,025,135, Cl. 219-506.000.

GET Sylvania Canada Ltd: *See—*
Gawad, Mahmoud A., 5,025,356, Cl. 362-221.000.

Getman, Daniel P.; and DeCrescenzo, Gary A., to Monsanto Company. 1,2-dideoxy-2-fluoronojirimycin as glycosidase inhibitors. 5,025,021, Cl. 514-302.000.

Gewin, Robert E.: *See—*
Clayton, James L.; and Gewin, Robert E., 5,025,444, Cl. 371-34.000.

Gewirtz, Jonah: *See—*
Skolnik, Howard; and Gewirtz, Jonah, 5,024,597, Cl. 432-2.000.

GEZE Sport International GmbH: *See—*
Bogner, Martin, 5,024,457, Cl. 280-632.000.

Ghafoerkhan, Shafiq M.: *See—*
Riel, Leslie L., 5,024,373, Cl. 229-68.00R.

Ghoshal, Uttam S.: *See—*
Kroger, Harry; and Ghoshal, Uttam S., 5,024,993, Cl. 505-1.000.

Gibbon, Robert M., to JMK International, Inc. Engine gasket with oil impermeable surface. 5,024,863, Cl. 427-387.000.

Gilbreath, Bobbie L.: *See—*
Gilbreath, John R.; and Gilbreath, Bobbie L., 5,024,292, Cl. 182-90.000.

Gilbreath, John R.; and Gilbreath, Bobbie L., to Bobbie Scope, Inc. Portable ladder assembly for truck trailers. 5,024,292, Cl. 182-90.000.

Gill, Manzur; and McElroy, David J., to Texas Instruments Incorporated. Cross-point contact-free floating-gate memory array with silicided buried bitlines. 5,025,494, Cl. 357-23.500.

Gillespie, Andrew J.: *See*—
Garthaffner, Martin T.; Keen, Billy J., Jr.; Gillespie, Andrew J.; Wheless, Jack C.; and Dingus, George W., 5,024,242, Cl. 131-94.000.

Gilliland, Malcolm T. Electronic welding station with AC and reversible polarity DC outputs. 5,025,127, Cl. 219-130.100.

Gilmozzi, Gunther: *See*—
Meinherz, Manfred; Veuhoff, Freidrich-Wilh; Gilmozzi, Gunther; and Kelch, Thomas, 5,025,118, Cl. 200-148.00R.

Ginsburgh, Irwin: *See*—
Zuchowski, Larry; Tichenor, Clyde I.; and Ginsburgh, Irwin, 5,024,521, Cl. 352-86.000.

Girard, David E., to Hay & Forage Industries. Quarter turn bale discharge apparatus. 5,024,152, Cl. 100-188.00R.

Girardin, Guy; Morin, Pierre; Nguyen, Duy; Nguyen, Duc; and Brunelle, Louise, to Les Enterprises Julien Inc. Refuse compactor. 5,024,151, Cl. 100-53.000.

Girvin, Richard J.: *See*—
Sohner, Harold K.; Hoyloak, Joel N.; Girvin, Richard J.; and Kumar, Surinder, 5,025,452, Cl. 375-1.000.

Gist-brocades: *See*—
Van Ee, Jan H., 5,024,943, Cl. 435-172.300.

Giuliani, Pierre; Le Page, Jean-Francois; Plumail, Jean-Claude; and Espaillac, Marcellin, to Institut Francais du Petrole. Catalytic composition comprising a metal sulfide suspended in a liquid containing asphaltenes and hydrovisbreaking process of a hydrocarbon charge. 5,024,751, Cl. 208-108.000.

Glasenapp, Rudi K. H.: *See*—
Pease, George E., Jr.; Romero, Ervin G.; and Glasenapp, Rudi K. H., 5,024,491, Cl. 303-93.000.

Glass, Emmett F.; Schoeneberger, Ernest A.; and Makofka, Stanley J., to Ford New Holland, Inc. Bolted double sickle cutterbar. 5,024,051, Cl. 56-297.000.

Glidden Company, The: *See*—
Craun, Gary P.; and Kunz, Barbara L., 5,025,063, Cl. 524-560.000.

Gloanec, Maurice; Jarry, Jacques; and Lailler, Jean L., to Thomson Hybrides et Microondes. Circuit for measuring the dynamic characteristics of a package for high-speed integrated circuits and a method for measuring said dynamic characteristics. 5,025,212, Cl. 324-158.00R.

Gmur, Bruno; and Kuhnemund, Bernd, to Gebrueder Buehler AG. Apparatus for the automatic determination of a continuous bulk material throughput by a continuous balance. 5,024,352, Cl. 222-1.000.

Goad, Conrad D.; and Taylor, Jeffrey L., to Precision Fabrics Group Inc.; and Standard Textile Co., Inc. Process for preparing a woven medical fabric. 5,024,851, Cl. 427-2.000.

Goavec, Jean-Jacques, to Goavec S.A. Installation for the making of food products, in particular expanded food products, such as ice cream. 5,024,066, Cl. 62-306.000.

Goavec S.A.: *See*—
Goavec, Jean-Jacques, 5,024,066, Cl. 62-306.000.

Godbersen, Byron L. Boat support roller assembly. 5,024,312, Cl. 193-37.000.

Godhwani, Nevand: *See*—
Murray, Roger W.; and Godhwani, Nevand, 5,024,962, Cl. 437-40.000.

Goeckel, Ulrich: *See*—
Oftring, Alfred; Birnbach, Stefan; Fikentscher, Rolf; Baur, Richard; Kud, Alexander; Goeckel, Ulrich; and Perner, Johannes, 5,025,103, Cl. 560-170.000.

Goerl, Udo: *See*—
Wolff, Siegfried; and Goerl, Udo, 5,025,047, Cl. 524-99.000.

Goesele, Ulrich M.; and Lehmann, Volker E. Method of producing a thin silicon on insulator layer by wafer bonding and chemical thinning. 5,024,723, Cl. 156-628.000.

Goglio, Luigi. Packaging bag, especially for cooked ham, provided with drain valve. 5,024,538, Cl. 383-103.000.

Gokcek, Cetin, to Messer Griesheim GmbH. Copper sulfate absorption mass to remove AsH_3, PH_3, B_2H_6, GeH_4 and SiH_4. 5,024,823, Cl. 423-210.000.

Goldstar Electron Co.: *See*—
Park, Yong; and Lee, Seo K., 5,024,963, Cl. 437-41.000.

Goldstone, Andrew C.; and Schettino, Raymond L. Electrode endotracheal tube. 5.024,228, Cl. 128-642.000.

Gono, Yoshitaka: *See*—
Yamazaki, Syoji; Oda, Toshikazu; Iwanaga, Kenji; and Gono, Yoshitaka, 5,025,237, Cl. 335-83.000.

Gonzales, Ralph: *See*—
Aitken, W. Sidney; and Gonzales, Ralph, 5,024,469, Cl. 285-302.000.

Gonzalez, Jose M., Jr.: *See*—
Donovan, William P.; Gonzalez, Jose M., Jr.; Levinson, Barry L.; and Macaluso, Anthony, 5,024,837, Cl. 424-93.000.

Goode, David P., to SKI Accessories, Inc. Composite ski pole and method of making same. 5,024,866, Cl. 428-36.400.

Goodzeit, Neil E.; and Linder, David M., to General Electric Company. Attitude control compensator for flexible spacecraft. 5,025,381, Cl. 364-434.000.

Gorin, Michael: *See*—
Nesburn, Anthony B.; Gorin, Michael; Martinez, Marvin; Kenney, M. Cristina; and Maguen, Ezra, 5,024,742, Cl. 204-157.680.

Gorkiewicz, Daniel W.: *See*—
Tibbetts, Gary G.; Gorkiewicz, Daniel W.; and Hammond, Dean C., Jr., 5,024,818, Cl. 422-158.000.

Gorler, Klaus; Krumbiegel, Gunter; Hanack, Michael; and Subramanian, Lakshmina R., to Madaus GmbH & Co. Methylendioxyphenathrene and stilben derivatives, process for the preparation thereof, pharmaceutical compositions using these, and therapeutic applications. 5,024,743, Cl. 204-157.690.

Gorman, Cornelia M., to Genentech, Inc. Transient expression system for producing recombinant protein. 5,024,939, Cl. 435-69.100.

Gorun, Sergiu M.; and Stibrany, Robert T., to Exxon Research & Engineering Company. Novel tetranuclear manganese complexes. 5,025,101, Cl. 556-50.000.

Goto, Gensuke, to Fujitsu Limited. Carry propagation circuit of parallel-type full adder. 5,025,409, Cl. 364-786.000.

Goto, Giichi; and Nagaoka, Akinobu, to Takeda Chemical Industries, Ltd. Alkylene diamines. 5,025,033, Cl. 514-417.000.

Goto, Tomoko: *See*—
Hanada, Kazuyuki; Kuroda, Kohichi; Misaizu, Iwao; Kashimura, Masashi; Goto, Tomoko; and Kuriyama, Katsumi, 5,024,893, Cl. 428-423.100.

Gottlebe, Jurgen: *See*—
Hank Dietrich; and Gottlebe, Jurgen, 5,024,156, Cl. 101-216.000.

Gottlieb, Mark: *See*—
Long, Robert; and Gottlieb, Mark, 5,024,186, Cl. 123-179.00B.

Gould, Nathaniel; Fontes, Michael; and Thessin, Tyler R., to Nathaniel Gould Diagnostics, Inc. Redotopography apparatus and method using moire fringe analysis to measure foot shapes. 5,025,476, Cl. 382-2.000.

Gow, Thomas W. Emergency lighting fixture. 5,025,349, Cl. 362-20.000.

Graeger, Volker; and Kobs, Rolf U. D., to U.S. Philips Corporation. Pressure sensor comprising a silicon body. 5,024,097, Cl. 73-727.000.

Graham, Daniel J.: *See*—
Colvin, Alex D.; Graham, Daniel J.; and Cassatta, Joseph C., 5,025,220, Cl. 324-449.000.

Graham, Mark D.: *See*—
Farrar, John M.; and Graham, Mark D., 5,024,786, Cl. 252-543.000.

Grald, Eric W.: *See*—
Buchholz, Robert L.; Grald, Eric W.; Nelson, Lorne W.; and Shah, Dipak J., 5,024,265, Cl. 165-22.000.

Grayson, Bille S.: *See*—
Sughrue, Edward L., II; Tooley, Patricia A.; Bertus, Brent J.; and Grayson, Bille S., 5,024,750, Cl. 208-57.000.

Graze, Russell R., Jr., to Caterpillar Inc. Fuel combustion system, method, and nozzle member therefor. 5,024,193, Cl. 123-259.000.

Great Western Foam Products Corporation: *See*—
Bontrager, Rick L., 5,024,328, Cl. 206-453.000.

Grecksch, Hans; and Engelhardt, Dietmar, to W. Schlafhorst & Co. Conveying apparatus for a textile winding machine. 5,024,389, Cl. 242-35.50A.

Grecsek, John J., to Colgate-Palmolive Company. Spray dried base beads for detergent compositions containing zeolite, bentonite and polyphosphate. 5,024,778, Cl. 252-140.000.

Greene, Arnold H.; and Holden, Harold E., to American Photo Systems, Inc. Microfilm reader with microfilm and reticle images provided to each of two binocular eyepieces. 5,024,512, Cl. 350-514.000.

Greene, Carol J.: *See*—
Wu, Stephen H. W.; Greene, Carol J.; and Sharma, Mahendra K., 5,025,004, Cl. 514-165.000.

Greenlee, Mark L.; DiNinno, Frank P.; Cama, Lovji D.; and Heck, James V., to Merck & Co., Inc. 2-(9-fluorenonyl)-carbapenem antibacterial agents. 5,025,007, Cl. 514-210.000.

Greenlee, Mark L.: *See*—
DiNinno, Frank P.; Salzmann, Thomas N.; and Greenlee, Mark L., 5,025,008, Cl. 514-210.000.

Greenshields, James N.; and Tetlow, Peter E., to ICI Americas Inc. Solvent extraction process. 5,024,821, Cl. 423-23.000.

Gregg, Thomas A.: *See*—
Casper, Daniel F.; Flanagan, John R.; Gregg, Thomas A.; Huang, Catherine C.; and Kalos, Matthew J., 5,025,458, Cl. 375-114.000.

Gregorio, Manuel Z.: *See*—
Schwartz, Russell J.; and Gregorio, Manuel Z., 5,024,698, Cl. 106-20.000.

Gregory, Danny L.; Priddy, Tommy G.; Smallwood, David O.; and Woodall, Tommy D., to United States of America, Energy. Composite slip table of dissimilar materials for damping longitudinal modes. 5,024,096, Cl. 73-663.000.

Griffin-Woodhouse Limited: *See*—
Timmington, David A., 5,024,548, Cl. 403-78.000.

Grigo, Ulrich: *See*—
Tacke, Peter; Grigo, Ulrich; Nouvertne, Werner; Freitag, Dieter; Idel, Karsten-Josef; and Westeppe, Uwe, 5,025,065, Cl. 524-611.000.

Grobmyer, Louis R.: *See*—
Impink, Albert J., Jr.; Grobmyer, Louis R.; Sariscak, Robert E.; Morita, Toshio; and Duryea, John L., 5,024,801, Cl. 376-217.000.

Groenendaal, John C., Jr.; and Rudy, Randy T., to Westinghouse Electric Corp. Fully floating inlet flow guide for double-flow low pressure steam turbines. 5,024,579, Cl. 415-108.000.

Grohrock, Peter, to Siemens Aktiengesellschaft. Lockable container for transporting and for storing semiconductor wafers. 5,024,329, Cl. 206-454.000.

Gronwald, Frederik; Andersen, Peter H.; Faarup, Peter; Guddal, Erling; Hansen, Kristian T.; Hansen, Louis B.; and Nielsen, Erik B., to Novo Nordisk A/S. Novel benzazepine derivatives. 5,025,009, Cl. 514-213.000.

Grossman, David G.; Karnas, Michael A.; and Johnson, Ronald E., to Corning Incorporated. Glazing dental constructs. 5,024,790, Cl. 264-16.000.

Grossman, Mark W.; and George, William A., to GTE Products Corporation. Recovery of mercury from mercury compounds via electrolytic methods. 5,024,738, Cl. 204-105.00R.

Grosveld, Ferdinand M. W. A.: *See*—
Shepherd, Kevin P.; and Grosveld, Ferdinand M. W. A., 5,024,288, Cl. 181-206.000.

Grubisic, Vatroslav: *See*—
Klock, Jurgen; Fischer, Gerhard; and Grubisic, Vatroslav, 5,024,102, Cl. 73-798.000.

Grumman Aerospace Corporation: *See*—
Fengelly, Raymond S., 5,023,993, Cl. 29-843.000.
Schwarz, Robert C., 5,025,285, Cl. 355-77.000.

Grunner, Erich: *See*—
Schmidt, Oskar; and Grunner, Erich, 5,024,800, Cl. 264-502.000.

GTE Laboratories Incorporated: *See*—
Boudreau, Robert A.; and Rideout, William C., 5,024,504, Cl. 350-96.180.
Eichen, Elliot G., 5,025,487, Cl. 455-618.000.

GTE Products Corporation: *See*—
Bouchard, Andre C.; Thibault, Paul A.; Lagushenko Radomir; Maya, Jakob; and Maya, Jakob, 5,025,190, Cl. 313-619.000.
Grossman, Mark W.; and George, William A., 5,024,738, Cl. 204-105.00R.
Maya, Jakob, 5,024,739, Cl. 204-157.200.
Maya, Jakob, 5,024,741, Cl. 204-157.220.

Guddal, Erling: *See*—
Gronwald, Frederik; Andersen, Peter H.; Faarup, Peter; Guddal, Erling; Hansen, Kristian T.; Hansen, Louis B.; and Nielsen, Erik B., 5,025,009, Cl. 514-213.000.

Guenther, Dieter: *See*—
Wingen, Rainer; Guenther, Dieter; and Lingnau, Juergen, 5,025,097, Cl. 548-235.000.

Guevel, Pierre M.; and Bardey, Philippe R., to Principia Recherche Developpement SA. Air or submarine engine with improved contour. 5,024,396, Cl. 244-35.00R.

Guggenberger, Rainer: *See*—
Gasser, Oswald; Guggenberger, Rainer; and Burger, Bernd, 5,024,711, Cl. 156-153.000.

Guichard, Louis. Automatic mechanical transmission apparatus with continuous variation of the transmission ratio from an infinite ratio up to a ratio less then 1/1. 5,024,637, Cl. 475-166.000.

Guirguis, Raouf A., to La Mina Ltd. Modular fluid sample preparation assembly. 5,024,237, Cl. 128-760.000.

Guirguis, Raouf A., to Cancer Diagnostics, Inc. Blood withdrawing apparatus and antigen testing method. 5,024,238, Cl. 128-771.000.

Gulley, David W.; and Van Aken, Jerry R., to Texas Instruments Incorporated. Graphics floating point coprocessor having matrix capabilities. 5,025,407, Cl. 364-754.000.

Gundlach, Douglas P., to DowBrands Inc. Prewetted absorbent pads and dispensing package therefor. 5,024,325, Cl. 206-229.000.

Gunn, Duncan A.; and McManus, Stephen J., to STC PLC. Hermetic gland for optical fibres. 5,024,503, Cl. 350-96.200.

Gupta, Dev V., to Integrated Network Corporation. Digital data over voice communication. 5,025,443, Cl. 370-76.000.

Gurd, John R.; and Kawakami, Katsura, to Victoria University of Manchester; and Matsushita Electrical Industrial Co., Ltd. Storage allocation and garbage collection using liberate space tokens. 5,025,367, Cl. 364-200.000.

Guslits, Vladimir S.; and Swapceinski, John P., to Eastman Kodak Company. Development apparatus having self-closing purging mechanism. 5,025,289, Cl. 355-253.000.

Gustafsson, Gert-Ove; Berntsson, Leif; and Larsson, Kåre, to Multistructure Sweden AB. Method for the production of a compound for increasing of frost-resistance of hardened concrete and the compound thus produced. 5,024,703, Cl. 106-649.000.

Gutag Innovations AG: *See*—
Guttinger, Kurt, 5,024,114, Cl. 74-86.000.

Guth Lighting Inc.: *See*—
Cannell, Timothy A., 5,025,358, Cl. 362-267.000.

Gutschmit, Alan, to Alandale Industries, Inc. Yarn threading apparatus for tube-type textile yarn creels. 5,024,393, Cl. 242-131.000.

Guttinger, Kurt, to Gutag Innovations AG. Wobble drive for a translationally moving structural part. 5,024,114, Cl. 74-86.000.

Guy, Jon S.: *See*—
Perona, Mark; Woller, Tom C.; and Guy, Jon S., 5,025,334, Cl. 360-96.500.

Guzman, Julio; and Spector, George. Compressible three chamber device for dispersing pomade. 5,024,546, Cl. 401-16.000.

H. B. Fuller Licensing & Financing, Inc.: *See*—
Malcolm, David B.; and Bunnelle, William L., 5,024,667, Cl. 604-382.000.

H. Bollmann Manufacturers Limited: *See*—
Mould, David, 5,025,255, Cl. 341-26.000.

Habu, Takaaki: *See*—
Okamoto, Kengo; Habu, Takaaki; and Muroi, Shoji, 5,025,263, Cl. 343-715.000.

Hachtel, Hansjorg: *See*—
Dobler, Klaus; and Hachtel, Hansjorg, 5,025,213, Cl. 324-207.120.

Hadley, Howard C.; and Myers, John R., to Deere & Company. Two unit folding hitch structures. 5,024,456, Cl. 280-412.000.

Haenni, Edwin W.; and Bolz, Hans-Peter, to Sonoco Products Company. Tube dispenser for flexible sheet material. 5,024,349, Cl. 221-46.000.

Hagg, Sandra L.: *See*—
Allaire, Roger A.; Friske, Mark S.; Hagg, Sandra L.; and Janas, Victor F., 5,024,978, Cl. 501-95.000.

Hagiwara, Hiroshi; Araki, Kazunori; and Michimori, Akihiro, to Matsushita Electric Works, Ltd. Stress dissolving refreshment system. 5,024,650, Cl. 600-26.000.

Hahn, Walter; Lutz, Ferdinand; and Jahn, Manfred, to Asea Brown Boveri Aktiengesellschaft. Spindle drive. 5,024,115, Cl. 74-89.150.

Haikl, Vojtech: *See*—
Lamb, William E.; Kowaleski, Jerome L.; Haikl, Vojtech; Bittancourt, Alan R.; and Daugherty, Harvey S., 5,025,280, Cl. 354-299.000.

Haines, John G.; Rosenbaum, Nolan G.; Pion, Albert L.; Lecarpentier, Marc; Henriot, Christophe; and Abumehdi, Cyrus, to FME Corporation. Postage meter transparent I/O interface. 5,025,383, Cl. 364-464.030.

Hains, Ralph N., to U.S. Philips Corporation. Matrix display device. 5,025,250, Cl. 340-811.000.

Hajime Industries Ltd.: *See*—
Yoshida, Hajime, 5,024,525, Cl. 354-126.000.

Haken, Roger A., to Texas Instruments Incorporated. Dual LDD submicron CMOS process for making low and high voltage transistors with common gate. 5,024,960, Cl. 437-34.000.

Hall, David M.: *See*—
McCullough, Francis P., Jr.; Snelgrove, R. Vernon; and Hall, David M., 5,024,877, Cl. 428-282.000.

Halliburton Logging Services, Inc.: *See*—
Roessler, Dennis E., 5,024,272, Cl. 166-117.700.

Halliburton, W. Ken, Jr. Redeemable coupon disbursement control and reporting system. 5,025,139, Cl. 235-379.000.

Hallinan, Linda L.: *See*—
Shaw, Schuyler S.; Hallinan, Linda L.; Hammersmith, Robert J.; Schenk, Donald E.; DeHoff, Edward J.; and Kade, Alexander, 5,024,299, Cl. 188-156.000.

Hamada, Fukusaburo: *See*—
Nozaki, Chikateru; Miyanohara, Atsushi; Hamada, Fukusaburo; Ohtomo, Nobuya; and Matsubara, Kenichi, 5,024,938, Cl. 435-68.100.

Hamada, Mitsuo: *See*—
Yoshida, Keiji; and Hamada, Mitsuo, 5,025,054, Cl. 524-267.000.

Hamada, Toshiaki: *See*—
Kokubo, Kouichi; Hamada, Toshiaki; Tagawa, Shinichi; Suzumura, Nobuyasu; Buma, Shuuichi; Aburaya, Toshio; Onuma, Toshio; Sato, Kunihito; Yonekawa, Takashi; Kawanishi, Masaki; Ikemoto, Hiroyuki; and Ohashi, Kaoru, 5,024,459, Cl. 280-707.000.

Hamamatsu Photonics Kabushiki Kaisha: *See*—
Aoshima, Shinichiro; Urakami, Tsuneyuki; and Tsuchiya, Yutaka, 5,025,142, Cl. 250-201.900.

Hamel, Leo F. Cord restraint. 5,024,402, Cl. 248-52.000.

Hamersma, Wilhelmus J. L. A.; Kempers, Torben P.; and Roovers, Wilhemus M. M., to General Electric Company. Polymer mixture comprising aromatic polycarbonate and two agents to improve the impact strength; articles formed therefrom. 5,025,055, Cl. 524-269.000.

Hamilton, Bruce H.: *See*—
McLachlan, Corran N. S.; Catchpole, Owen J.; and Hamilton, Bruce H., 5,024,846, Cl. 426-312.000.

Hammer, Hartmut: *See*—
Mertens-Gottselig, Dagmar; Hammer, Hartmut; Muller, Heinrich; and Wildersohn, Manfred, 5,024,678, Cl. 44-348.000.

Hammersmith, Robert J.: *See*—
Shaw, Schuyler S.; Hallinan, Linda L.; Hammersmith, Robert J.; Schenk, Donald E.; DeHoff, Edward J.; and Kade, Alexander, 5,024,299, Cl. 188-156.000.

Hammond, Dean C., Jr.: *See*—
Tibbetts, Gary G.; Gorkiewicz, Daniel W.; and Hammond, Dean C., Jr., 5,024,818, Cl. 422-158.000.

Han, Ru-Jen L.: *See*—
Carson, Matthew; Han, Ru-Jen L.; and LeMahieu, Ronald A., 5,025,036, Cl. 514-568.000.

Han, Scott: *See*—
DeCaul, Lorenzo C.; Han, Scott; Palermo, Robert E.; and Walsh, Dennis E., 5,025,109, Cl. 585-500.000.

Hanack, Michael: *See*—
Gorler, Klaus; Krumbiegel, Gunter; Hanack, Michael; and Subramanian, Lakshmina R., 5,024,743, Cl. 204-157.690.

Hanada, Kazuyuki; Kuroda, Kohichi; Misaizu, Iwao; Kashimura, Masashi; Goto, Tomoko; and Kuriyama, Katsumi, to Dainichiseika Color & Chemicals Mfg. Co., Ltd.; and Ukima Colour & Chemicals Mfg. Co. Ltd. Heat-sensitive recording medium. 5,024,893, Cl. 428-423.100.

Haneda, Satoshi; and Nomori, Hiroyuki, to Konica Corporation. Dot exposure type image forming apparatus. 5,025,272, Cl. 346-153.100.

Hank Dietrich; and Gottlebe, Jurgen, to Veb Kombinat Polygraph "Werner Lamberz" Leipzig. Safety device for the control of web-fed rotary printing machines. 5,024,156, Cl. 101-216.000.

Hanlon, J. Vincent; and Culley, Scott A., to Ethyl Corporation. Alkyl phenol stabilizer compositions for fuels and lubricants. 5,024,775, Cl. 252-52.00R.

Hannen, Jakob, to Kleinewefers GmbH. Label applying apparatus. 5,024,718, Cl. 156-475.000.

Hansen, Henning. Articulated support arm. 5,025,126, Cl. 219-125.100.

Hansen, Kristian T.: *See*—
Gronwald, Frederik; Andersen, Peter H.; Faarup, Peter; Guddal, Erling; Hansen, Kristian T.; Hansen, Louis B.; and Nielsen, Erik B., 5,025,009, Cl. 514-213.000.

Hansen, Louis B.: *See*—
Gronwald, Frederik; Andersen, Peter H.; Faarup, Peter; Guddal, Erling; Hansen, Kristian T.; Hansen, Louis B.; and Nielsen, Erik B., 5,025,009, Cl. 514-213.000.

Hanson, Gary N.; and Inness, Keith W., to Insulock Corporation. Building block and structures formed therefrom. 5,024,035, Cl. 52-591.000.

Hanson, Reed D.; and Radcliffe, Scott T., to General Motors Corporation. Output filter and method for on/off semi-active suspension control. 5,024,460, Cl. 280-707.000.

Hanssler, Gerd: *See*—
Lantzsch, Reinhard; Kysela, Ernst; Buchel, Karl H.; Dutzmann, Stefan; Brandes, Wilhelm; and Hanssler, Gerd, 5,025,030, Cl. 514-383.000.

Hara, Mitsuhiko: *See*—
Hirayama, Hiromichi; Hara, Mitsuhiko; Mihara, Masato; and Harumatsu, Mitsuo, 5,025,331, Cl. 360-85.000.

Harada, Naoto: *See*—
Sekine, Shuji; and Harada, Naoto, 5,025,184, Cl. 310-71.000.

Harame, David L.; and Stork, Johannes M. C., to International Business Machines Corporation. Method of fabricating a bipolar transistor with ultra-thin epitaxial base. 5,024,957, Cl. 437-31.000.

Harandi, Mohsen N.; and Owen, Hartley, to Mobil Oil Corporation. Olefins etherification and conversion to liquid fuels with paraffins dehydrogenation. 5,024,679, Cl. 44-449.000.

Harbarger, Josephine A.; Oliver, David; and Anthony, Ella L., to Motorola, Inc. Heating apparatus and method for semiconductor material slicing process. 5,024,207, Cl. 125-35.000.

Hardin, Tommy G.; and Khorramian, Behrooz A., to AT&T Bell Laboratories. Plenum cables which include non-halogenated plastic materials. 5,024,506, Cl. 350-96.230.

Hardy, Jean-Claude: *See*—
Barreau, Michel; Hardy, Jean-Claude; Martin, Jean-Paul; and Renault, Christian, 5,025,013, Cl. 514-253.000.

Hargrave, David L. Tool for repairing pop-up sprinklers. 5,023,989, Cl. 29-426.500.

Harig, Horst; and Kersting, Hermann, to CLAAS OHG. Harvester thresher. 5,024,630, Cl. 460-21.000.

Harigaya, Makoto: *See*—
Yamada, Katsuyuki; Ide, Yukio; Harigaya, Makoto; and Iwasaki, Hiroko, 5,024,927, Cl. 430-495.000.

Harney James D.: *See*—
Crain, Ronald A.; Harney James D.; and Carey, James R., 5,025,436, Cl. 369-77.200.

Harp, Raymond S.; and Smith, Donald L., to Tredegar Industries, Inc. Method for producing an embossed oriented film. 5,024,799, Cl. 264-284.000.

Harrelson, Hugh G., Jr.: *See*—
Yeh, Ling; and Harrelson, Hugh G., Jr., 5,024,869, Cl. 428-97.000.

Harris Corporation: *See*—
Sikand, Parminder S.; McAllister, Mary J.; Henel, John; Jackson, Allen L.; and Bell, Karen, 5,025,468, Cl. 379-67.000.

Harrison, Andrew B., to British Aerospace Public Limited Company. Method and apparatus for remote position sensing using edge diffraction. 5,024,527, Cl. 356-124.000.

Harrison, Frank. Vehicle heating system. 5,024,377, Cl. 237-2.00A.

Harrison, Michael G.: *See*—
Millard, Michael L.; Harrison, Michael G.; and Szweda, Andrew, 5,024,859, Cl. 427-226.000.

Harrold, Ronald T.; and Sanjana, Zal N., to Westinghouse Electric Corp. Method and apparatus for selective transmission and reflection of sound through a solid. 5,024,092, Cl. 73-602.000.

Harshman, Robert L.: *See*—
Gasaway, Jack S.; Parsons, J. Stuart; and Harshman, Robert L., 5,024,656, Cl. 604-70.000.

Hart, Colin: *See*—
Fluent, Stewart L.; Hart, Colin; McCree, Charles D.; and Lotsch, Charles F., 5,024,045, Cl. 53-443.000.

Hartke, David J.; and Appelt, Kathleen A., to Outboard Marine Corporation. Fuel supply system component assembly. 5,024,188, Cl. 123-195.00A.

Hartley, Richard I.; Corbett, Peter F.; Yassa, Fathy F.; and Noujaim, Sharbel E., to General Electric Company. Increased performance of digital integrated circuits by processing with multiple-bit-width digits. 5,025,257, Cl. 341-101.000.

Hartmann, Hans S., to Du Pont de Nemours, E. I., and Company. Crystallizable, low dielectric constant, low dielectric loss composition. 5,024,975, Cl. 501-65.000.

Hartmann, Heinrich: *See*—
Crema, Stefano C.; Kucera, Clare H.; Konrad, Gerd; and Hartmann, Heinrich, 5,025,040, Cl. 523-130.000.

Hartweck, Lynn M.: *See*—
Collins, Glenn B.; Hildebrand, David F.; Lazzeri, Paul A.; Adams, Thomas R.; Parrott, Wayne A.; and Hartweck, Lynn M., 5,024,944, Cl. 435-172.300.

Hartz, Dale E.: *See*—
Wuepper, Karl J.; Swanson, Jerald L.; and Hartz, Dale E., 5,023,987, Cl. 29-402.110.

Harumatsu, Mitsuo: *See*—
Hirayama, Hiromichi; Hara, Mitsuhiko; Mihara, Masato; and Harumatsu, Mitsuo, 5,025,331, Cl. 360-85.000.

Harvey, Mary A. Panty hose for wearing under an abbreviated outer garment. 5,023,957, Cl. 2-409.000.

Harvey, Thomas J., to AEC-Able Engineering Co., Inc. Adjustment of zero spring rate suspensions. 5,024,111, Cl. 73-865.600.

Harwood, Ronald P. Combination lighting fixture and graphic display means. 5,025,355, Cl. 362-147.000.

Hasebe, Masahiro: *See*—
Sakakibara, Shiro; Hasebe, Masahiro; and Hattori, Masashi, 5,024,638, Cl. 475-210.000.

Hasegawa, Hirofumi; Ohmori, Naoto; Yamada, Yukio; and Yoshida, Narutaka, to Minolta Camera Kabushiki Kaisha. Laser beam image forming apparatus with SOS Detection. 5,025,286, Cl. 355-244.000.

Hasegawa, Makoto; Takahashi, Kazuaki; Makimoto, Mitsuo; Takahashi, Masao; and Shimazu, Takayuki, to Matsushita Electric Industrial Co., Ltd. Voltage-controlled oscillator using a surface elastic wave resonator. 5,025,229, Cl. 331-107.00A.

Hashimoto Corporation: *See*—
Hashimoto, Kazuo, 5,025,324, Cl. 358-335.000.

Hashimoto, Hisashi: *See*—
Nose, Toshiro; Hashimoto, Hisashi; and Manda, Masato, 5,025,395, Cl. 364-518.000.

Hashimoto, Kazuo, to Hashimoto Corporation. Method of and apparatus for recording information on both a main recording medium and an endless recording medium for repeated event monitoring. 5,025,324, Cl. 358-335.000.

Hashimoto, Michiaki: *See*—
Morishita, Hajime; Hayashi, Nobuaki; Nonogaki, Saburo; Hashimoto, Michiaki; Ito, Masato; Nishizawa, Masahiro; Miura, Kiyoshi; and Odaka, Yoshiyuki, 5,024,920, Cl. 430-325.000.

Hashimoto, Satoshi: *See*—
Yoshida, Mamoru; Suya, Hachiro; Hayashi, Shoji; Koshiyama, Takao; Hashimoto, Satoshi; and Horita, Katsuhiro, 5,025,042, Cl. 523-216.000.

Hata, Yoshiaki: *See*—
Taniguchi, Nobuyuki; Hata, Yoshiaki; Kudo, Yoshinobu; Inoue, Manabu; Hoda, Takeo; and Ueda, Hiroshi, 5,025,275, Cl. 354-106.000.

Hatanaka, Masahiko: *See*—
Nakanishi, Masahiro; Mori, Daisuke; Fujii, Katsuyoshi; Hatanaka, Masahiko; and Shinada, Hiroko, 5,024,133, Cl. 84-615.000.

Hatfield, Dean C., Jr., to Hughes Aircraft Company. Integrated multispectral boresight target generator. 5,025,149, Cl. 250-342.000.

Hatfield, Stephen C.; Andrews, Mena G.; and Broders, Richard P., to Combustion Engineering, Inc. Debris catching spring detent spacer grid. 5,024,807, Cl. 376-352.000.

Hattori, Akio: *See*—
Fukui, Tetsu; Yoshii, Takashi; Takemura, Toshihiko; and Hattori, Akio, 5,024,306, Cl. 192-3.570.

Hattori, Katsuji: *See*—
Tanaka, Tsuneo; Sato, Kazue; Takewa, Hiroyuki; Kurozuka, Akira; Tamura, Tadashi; Hattori, Katsuji; Takayama, Satoshi; Murata, Kosaku; Satoh, Katsuaki; Serikawa, Mituhiko; Kimura, Youichi; and Obata, Shuichi, 5,025,474, Cl. 381-90.000.

Hattori, Masashi: *See*—
Sakakibara, Shiro; Hasebe, Masahiro; and Hattori, Masashi, 5,024,638, Cl. 475-210.000.

Hattori, Yoshihiro, to Minolta Camera Kabushiki Kaisha. Charging device for electrophotographic systems. 5,025,155, Cl. 250-326.000.

Haughton, David R.: *See*—
Mazuch, Ludvik; and Haughton, David R., 5,024,702, Cl. 106-277.000.

Havasi, Gabor: *See*—
Fejerdy, Istvan; Farkas, Otto ; and Havasi, Gabor, 5,024,424, Cl. 267-64.270.

Havens, Marvin R., to W. R. Grace & Co.-Conn. Antistatic thermoplastic/polyamide-polyether compositions and antistatic polymeric films made therefrom. 5,024,792, Cl. 264-22.000.

Hawley, Dan W.: *See*—
Moss, Mary G.; Brewer, Terry; Cuzmar, Ruth M.; Hawley, Dan W.; and Flaim, Tony D., 5,024,922, Cl. 430-330.000.

Hawley, Erwin T.; and Kladden, Gregory S., to Rexnord Corporation. Seal cartridge assembly. 5,024,450, Cl. 277-37.000.

Hawley, Gil P.; and McDaniel, Max P., to Phillips Petroleum Company. Silica-containing olefin polymerization catalysts and process. 5,024,982, Cl. 502-110.000.

Hay & Forage Industries: *See*—
Girard, David E., 5,024,152, Cl. 100-188.00R.

Hayakawa, Kunio: *See*—
Ilyama, Kiyotaka; Hayakawa, Kunio; Nakata, Masahiro; Kodera, Kaoru; and Miyazaki, Osamu, 5,024,699, Cl. 106-21.000.

Hayashi, Akimine: *See*—
Murakami, Satoru; Yamaguchi, Minori; Hayashi, Akimine; Kondo, Masataka; and Tawada, Yoshihisa, 5,025,297, Cl. 357-30.000.

Hayashi, George, to Swift Instruments, Inc. Microscope. 5,024,513, Cl. 350-518.000.

Hayashi, Gouichi: *See*—
Suzuki, Yoshiaki; and Hayashi, Gouichi, 5,024,923, Cl. 430-372.000.

Hayashi, Michio: *See*—
Matsumoto, Fukuji; Tawara, Yoshio; Hayashi, Michio; and Yamada, Osamu, 5,024,423, Cl. 266-283.000.

Hayashi, Nobuaki: *See—*
Morishita, Hajime; Hayashi, Nobuaki; Nonogaki, Saburo; Hashimoto, Michiaki; Ito, Masato; Nishizawa, Masahiro; Miura, Kiyoshi; and Odaka, Yoshiyuki, 5,024,920, Cl. 430-325.000.
Hayashi, Shigeyuki: *See—*
Nakata, Takashi; Tomizawa, Takashi; Hayashi, Shigeyuki; Ohno, Motoshi; and Horaguchi, Yoichi, 5,025,281, Cl. 355-27.000.
Hayashi, Shoji: *See—*
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Hayden, James D.: *See—*
Baker, Frank K.; and Hayden, James D., 5,024,971, Cl. 437-228.000.
Hayes, Leon, to Backeze Limited. Apparatus for use in relieving neck and/or back pain. 5,024,214, Cl. 128-75.000.
Hayes, Norman J.; and Avedon, Raymond B., to Identification Technology Corporation. Identification tag assembly. 5,024,013, Cl. 40-301.000.
Haynes, Deborah I.: *See—*
Hefner, Robert E., Jr.; and Haynes, Deborah I., 5,024,785, Cl. 252-299.010.
Hays, Donald F., Jr., to Extrusion Services, Inc. Flyknife cutter for extruded materials. 5,024,130, Cl. 83-444.000.
Hayward, James E., to Innovative Metal Inc. Desk system. 5,024,167, Cl. 108-50.000.
Hazel, Nicholas J., to BP Chemicals Limited. Production of non-conjugated diolefins. 5,025,111, Cl. 585-601.000.
HDRK Mining Research Limited: *See—*
Pettigrew, Michel J.; Rhodes, David B.; Lux, Eric G.; and Mason, Victor A., 5,024,090, Cl. 73-572.000.
Heck, Ernst; and Horisberger, Jean, to Nestec S. A. Continuous stamping machine. 5,024,719, Cl. 156-522.000.
Heck, James V.: *See—*
Greenlee, Mark L.; DiNinno, Frank P.; Cama, Lovji D.; and Heck, James V., 5,025,007, Cl. 514-210.000.
Hefner, Robert E., Jr.; and Haynes, Deborah I., to Dow Chemical Company, The. Liquid crystal/rigid rodlike polymer modified epoxy/vinyl ester resins. 5,024,785, Cl. 252-299.010.
Hegeman, George D.; and Nickens, David G., to BioTrol, Inc. Aerobic bacterial remediation of aliphatic chlorinated hydrocarbon contamination. 5,024,949, Cl. 435-262.000.
Hehl, Karl. Apparatus for transporting moldings from an injection molding machine. 5,024,593, Cl. 425-556.000.
Heidelberger Druckmaschinen AG: *See—*
Jahn, Hans-Georg, 5,024,155, Cl. 101-216.000.
Thunker, Norbert; Pollich, Gerhard; and Luxem, Heiner, 5,024,432, Cl. 271-268.000.
Heidjann, Franz; and Kleingraeber, Karl-Josef, to Claas OHG. Combine harvester. 5,024,631, Cl. 460-75.000.
Heijne, Wilhelmus, to Hoogovens Groep B.V. Method of measurement of the level of the surface of a metal bath. 5,024,086, Cl. 73-292.000.
Hein, H. A. Tillmann: *See—*
Freeman, Andrew B.; and Hein, H. A. Tillmann, 5,024,655, Cl. 604-53.000.
Heinig, Charles F.: *See—*
Asher, Marc A.; Strippgen, Walter E.; Heinig, Charles F.; and Carson, William, 5,024,213, Cl. 128-69.000.
Heinrich, Norbert, to U.S. Philips Corporation. Overload protected rack and pinion drive for an optical scanning device. 5,025,371, Cl. 369-219.000.
Helioff, Michael W.; Tazi, Mohammed; Kwak, Yoon T.; and Login, Robert B., to GAF Chemicals Corporation. Creamy nail polish remover containing hydrolyzed and neutralized maleic anhydride C_1–C_4 alkyl vinyl ether copolymer. 5,024,779, Cl. 252-162.000.
Hellman, Lars G. Multistage isothermal air dehumidification. 5,024,062, Cl. 62-92.000.
Hemedix International, Inc.: *See—*
Kaufman, Jerry M., 5,024,665, Cl. 604-179.000.
Hemus, David S., to CMB Foodcan plc. Method and apparatus for closing cartons. 5,024,317, Cl. 198-415.000.
Hendricks, Diana: *See—*
Chu, George H.; Ogawa, Yasushi; McPherson, John M.; Ksander, George; Pratt, Bruce; Hendricks, Diana; and McMullin, Hugh, 5,024,841, Cl. 424-422.000.
Henel, John: *See—*
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Heng, Jean-Paul; and Marmonier, Andre , to Societe Anonyme dite: CEGELEC. Connection device for a coaxial cable and a corresponding connection module, in particular a junction block. 5,024,608, Cl. 439-578.000.
Henk, Michael G.; and Summers, Jack C., II, to Allied-Signal Inc. Layered automotive catalytic composite. 5,024,824, Cl. 423-213.500.
Henke, Daniel L.: *See—*
Burton, James F.; and Henke, Daniel L., 5,025,372, Cl. 364-406.000.
Henning, Rainer: *See—*
Oekonomopulos, Raymond; Henning, Rainer; Lerch, Ulrich; Scholkens, Bernward; and Linz, Wolfgang, 5,025,010, Cl. 514-224.200.
Henriot, Christophe: *See—*
Haines, John G.; Rosenbaum, Nolan G.; Pion, Albert L.; Lecarpentier, Marc; Henriot, Christophe; and Abumehdi, Cyrus, 5,025,383, Cl. 364-464.030.
Hens, Jozef F.: *See—*
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Henshaw, Terry L.: *See—*
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Her Majesty the Queen In Right of New Zealand Acting by and Through the Minister of Forestry for New Zealand: *See—*
Vinden, Peter; Burton, Russell J.; and Vaioleti, Timote M., 5,024,861, Cl. 427-254.000.
Hercules Incorporated: *See—*
Burnier, Julia S., 5,025,048, Cl. 524-99.000.
Desmarais, Armand J., 5,024,701, Cl. 106-35.000.
Gawin, Irena; and Swetlin, Brian J., 5,025,045, Cl. 523-440.000.
Herrin, Jerry J.: *See—*
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Hescor Canada Ltd.: *See—*
Wheller, Wayne D., 5,025,467, Cl. 379-60.000.
Hess, David W., to Motorola, Inc. Communication system with improved resource assignment. 5,025,254, Cl. 340-826.000.
Hetrick, George L.: *See—*
Holtkamp, Calvin J.; Hetrick, George L.; and Warren, Richard, 5,025,242, Cl. 337-309.000.
Hettinger, Arthur C., to AMP Incorporated. Contact system normal force gage. 5,024,106, Cl. 73-862.540.
Hewlett-Packard Company: *See—*
Baker, Jeffrey P.; La, Duong T.; and Coverstone, Randy A., 5,025,271, Cl. 346-140.00R.
Hudson, Kevin R., 5,025,325, Cl. 358-447.000.
Stephens, Bruce A., 5,025,403, Cl. 364-709.070.
Su, David K., 5,025,204, Cl. 323-274.000.
Swanson, Roger W., 5,025,405, Cl. 364-723.000.
Zellmer, Joel A., 5,025,364, Cl. 364-200.000.
Hi-Sonic Co., Ltd.: *See—*
Yamagiwa, Tamio, 5,024,254, Cl. 137-219.000.
Higashi, Hirofumi: *See—*
Ushio, Sadakatsu; Nakamura, Noboru; Higashi, Hirofumi; Iwata, Masataka; and Niwa, Fumiyasu, 5,024,189, Cl. 123-195.00R.
Higuchi, Mitsuhiro: *See—*
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Hilbert, Thomas K., to Eastman Kodak Company. Development apparatus having dual interleaving paddle mixers. 5,025,287, Cl. 355-245.000.
Hildebrand, David F.: *See—*
Collins, Glenn B.; Hildebrand, David F.; Lazzeri, Paul A.; Adams, Thomas R.; Parrott, Wayne A.; and Hartweck, Lynn M., 5,024,944, Cl. 435-172.300.
Hill, Berlie R.; Watson, Thomas F., Sr.; and Triplett, Benny L., to Burlington Industries, Inc. Antimicrobial microporous coating. 5,024,875, Cl. 428-267.000.
Hill, Diane E. Resealable compartmented bags. 5,024,536, Cl. 383-38.000.
Hill, Stephen H., to Sealed Power Technologies, L.P. PCV oil separator system. 5,024,203, Cl. 123-573.000.
Hilligoss, William R.; Hillogoss, Lawrence D.; Van Winkle, David; and Butler, Myron C., to Communications Manufacturing Company. Telephone test instrument. 5,025,466, Cl. 379-1.000.
Hillogoss, Lawrence D.: *See—*
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Himes, John L., Jr.: *See—*
French, Jay L.; Himes, John L., Jr.; Weber, Ronald M.; and Wise, James H., 5,024,610, Cl. 439-857.000.
Hinterholzer, Hans. Resilient slalom gate. 5,024,551, Cl. 404-10.000.
Hinzmann, Gerd; Nies, Norbert; and Radewahn, Siegfried, to Mannesmann Aktiengesllschaft. Method for manufacturing dimensionally correct compacts. 5,024,811, Cl. 419-66.000.
Hirai, Kenji: *See—*
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Hiraki, Akio: *See—*
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Hirano, Akihiro: *See—*
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Murano, Katsuaki; Yamashita, Yoshinori; Hirano, Sadayuki; Tatsumi, Takumi; and Yamamoto, Hiroaki, 5,024,310, Cl. 192-0.076.
Hirata, Eiji: *See—*
Tanaka, Nobuhiro; Hirata, Eiji; Moriguchi, Hideyuki; Azekura, Ko; Tsubone, Akira; and Ryu, Yasunori, 5,024,572, Cl. 414-276.000.
Hirayama, Hiromichi; Hara, Mitsuhiko; Mihara, Masato; and Harumatsu, Mitsuo, to Victor Company of Japan, Ltd. Tape casette loading system compatible with two different sized cassettes. 5,025,331, Cl. 360-85.000.
Hiroaki Yanagida: *See—*
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Hirono, Yutaka; Kiyama, Seiichi; and Osumi, Masato, to Sanyo Electric Co., Ltd. Dry-etching method. 5,024,724, Cl. 156-643.000.
Hirose Electric Co., Ltd.: *See—*
Masaki, Takashi, 5,023,992, Cl. 29-705.000.
Hirose, Fumiyuki: *See—*
Sato, Isao; Kirikami, Seiichi; Shimura, Akira; Hirose, Fumiyuki; Inose, Hiroshi; Urushidani, Haruo; and Arai, Osamu, 5,024,055, Cl. 60-39.270.

Hirose, Hiroaki: *See*—
Nagato, Shoin; Taguchi, Ryusuke; Hirai, Kenji; Hirose, Hiroaki; and Yokota, Masahiro, 5,024,692, Cl. 71-86.000.
Hitachi Engineering Co., Ltd.: *See*—
Inoue, Haruki; Funabashi, Motohisa; Yahiro, Masakazu; and Tanaka, Fumiki, 5,025,499, Cl. 364-165.000.
Hitachi Koki Co., Ltd.: *See*—
Arimoto, Akira; Saito, Susumu; Tsunoda, Yoshito; Moriyama, Shigeo; and Mochizuki, Takeshi, 5,025,268, Cl. 346-108.000.
Hitachi, Ltd.: *See*—
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Komoriya, Susumu; Nishizuka, Hiroshi; Nakagawa, Shinya; and Maejima, Hisashi, 5,025,284, Cl. 355-53.000.
Morishita, Hajime; Hayashi, Nobuaki; Nonogaki, Saburo; Hashimoto, Michiaki; Ito, Masato; Nishizawa, Masahiro; Miura, Kiyoshi; and Odaka, Yoshiyuki, 5,024,920, Cl. 430-325.000.
Moriwaki, Nobuyuki; Higuchi, Mitsuhiro; and Toshita, Mitsuhiro, 5,025,422, Cl. 365-233.500.
Nose, Toshiro; Hashimoto, Hisashi; and Manda, Masato, 5,025,395, Cl. 364-518.000.
Sasaki, Souji; Kino, Hirotoshi; Musha, Yoshinori; Kubota, Jun; and Okada, Hisao, 5,024,093, Cl. 73-633.000.
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Sekiya, Hiroshi; Kurita, Toshiyuki; Nakagaki, Nobufumi; and Murata, Toshinori, 5,025,310, Cl. 358-19.000.
Shimizu, Shinji, 5,025,301, Cl. 357-54.000.
Tamura, Katsuyoshi, 5,025,490, Cl. 313-479.000.
Uematsu, Tsuyoshi; and Saitoh, Tadashi, 5,024,953, Cl. 437-2.000.
Hitachi Seiko Ltd.: *See*—
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Hitachi Video Engineering, Inc.: *See*—
Sekiya, Hiroshi; Kurita, Toshiyuki; Nakagaki, Nobufumi; and Murata, Toshinori, 5,025,310, Cl. 358-19.000.
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Hittner, Herman J.; and Nguyen, Quyen C., to Aluminum Company of America. Stabilization of fluorides of spent potlining by chemical dispersion. 5,024,822, Cl. 423-111.000.
Hoberman, Charles. Radial expansion/retraction truss structures. 5,024,031, Cl. 52-81.000.
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Dinter, Peter; Funke, Hermann; and Matschke, Klaus, 5,024,819, Cl. 422-186.060.
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Hoechst Celanese Corp.: *See*—
Vora, Rohitkumar H.; and Chen, Paul N., Sr., 5,025,089, Cl. 528-353.000.
Hoff, Richard: *See*—
DePellegrini, Donald D.; Acker, William E.; and Hoff, Richard, 5,024,038, Cl. 52-700.000.
Hoffmann, Cristiano: *See*—
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Hoffmann-La Roche Inc.: *See*—
Carson, Matthew; Han, Ru-Jen L.; and LeMahieu, Ronald A., 5,025,036, Cl. 514-568.000.
Hofsess, Alexander, and Dao-Xuan, Phon, to Diskus Werke Frankfurt ammain Aktiengesellschaft. Tool mounting mechanism for a machine tool. 5,024,027, Cl. 51-34.00H.
Hogan, Scott A.: *See*—
Holcomb, Gregory W.; Hogan, Scott A.; and Holcomb, Samuel R., 5,024,129, Cl. 83-107.000.
Hogrefe, Arthur F., to Johns Hopkins University, The. Pulse to zero digital (PZ) modulation. 5,025,454, Cl. 375-41.000.
Hohnerlein, Ernst. Method and apparatus for applying a flux. 5,024,856, Cl. 427-57.000.
Holcomb, Gregory W.; Hogan, Scott A.; and Holcomb, Samuel R., to Holcomb, Gregory W. Radial lead component feeder having a narrow footprint. 5,024,129, Cl. 83-107.000.
Holcomb, Samuel R.: *See*—
Holcomb, Gregory W.; Hogan, Scott A.; and Holcomb, Samuel R., 5,024,129, Cl. 83-107.000.
Holden, Harold E.: *See*—
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Holifield, William R., III: *See*—
Jay, Jerry L., Sr.; and Holifield, William R., III, 5,024,245, Cl. 134-108.000.
Holland-Letz, Horst; and Bubel, Rainer, to Felo-Werkzeugfabrik. Slip-resistant plastic surface and process for producing such. 5,024,126, Cl. 81-489.000.
Holler, Thomas D., to Ametek, Inc. Method of making a composite filter. 5,024,764, Cl. 210-484.000.
Holmgreen, W. Corbett; and Bunegin, Leonid, to Board of Regents, The University of Texas System. Nasotracheal tube insertion connector. 5,024,220, Cl. 128-207.180.
Holtkamp, Calvin J.; Hetrick, George L.; and Warren, Richard, to Robertshaw Controls Company, Inc. Oven thermostat. 5,025,242, Cl. 337-309.000.
Holz, Josef: *See*—
Buhl, Horst; Holz, Josef; and Dany, Franz-Josef, 5,024,825, Cl. 423-309.000.
Holzmann, Olar W. R.: *See*—
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Holzwarth, Henry A., to United States Surgical Corporation. Armed suture package. 5,024,322, Cl. 206-63.300.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Ito, Toshifumi; Ohta, Atsuo; and Yamashita, Shoji, 5,024,113, Cl. 74-6.000.
Kamimura, Kenji; and Tsuzuki, Sadachika, 5,025,377, Cl. 364-424.020.
Kawaguchi, Masaaki; Okamuro, Tomio; and Shirose, Keiichi, 5,024,464, Cl. 280-731.000.
Nagahiro, Kenichi; and Moriya, Takashi, 5,024,191, Cl. 123-198.00D.
Honda, Yukihiro: *See*—
Ishii, Akihiko; Honda, Yukihiro; and Matsui, Toshio, 5,025,202, Cl. 320-32.000.
Honeywell Inc.: *See*—
Buchholz, Robert L.; Graid, Eric W.; Nelson, Lorne W.; and Shah, Dipak J., 5,024,265, Cl. 165-22.000.
Kahler, Jeffrey A., 5,025,378, Cl. 364-424.060.
Phinney, Thomas L., 5,025,500, Cl. 370-85.130.
Hong, John H.: *See*—
Yeh, Pochi A.; and Hong, John H., 5,025,488, Cl. 455-619.000.
Honjo, Kouji: *See*—
Saito, Yasuo; Yahata, Mitsuru; Honjo, Kouji; and Matsubayashi, Takayuki, 5,025,463, Cl. 378-19.000.
Hoogovens Groep B.V.: *See*—
Heijne, Wilhelmus, 5,024,086, Cl. 73-292.000.
Hopkins, Ronald J.: *See*—
Land, John T.; and Hopkins, Ronald J., 5,024,808, Cl. 376-353.000.
Horaguchi, Yoichi: *See*—
Nakata, Takashi; Tomizawa, Takashi; Hayashi, Shigeyuki; Ohno, Motoshi; and Horaguchi, Yoichi, 5,025,281, Cl. 355-27.000.
Horan, Ann C, to Schering Corporation. Actinomadura fulva subsp indica. 5,024,950, Cl. 435-825.000.
Horan, Robert T.: *See*—
Sandel, Dan; Horan, Robert T.; Gaba, Rodolfo; and Ramirez, Bruno J., 5,024,326, Cl. 206-366.000.
Hori, Mitukazu: *See*—
Matuo, Ken-iti; Nakata, Muneo; Hori, Mitukazu; and Tanihara, Isaji, 5,025,238, Cl. 335-128.000.
Horiba, Ltd.: *See*—
Kotani, Haruo; and Tomita, Katsuhiko, 5,024,951, Cl. 436-8.000.
Nishioka, Yasuyuki; and Hirano, Akihiro, 5,024,108, Cl. 73-863.110.
Horisberger, Jean: *See*—
Heck, Ernst; and Horisberger, Jean, 5,024,719, Cl. 156-522.000.
Horita, Katsuhiro: *See*—
Yoshida, Mamoru; Suya, Hachiro; Hayashi, Shoji; Koshiyama, Takao; Hashimoto, Satoshi; and Horita, Katsuhiro, 5,025,042, Cl. 523-216.000.
Hornak, Joseph P.: *See*—
Bryant, Robert G.; Hornak, Joseph P.; and Marshall, Eric A., 5,024,229, Cl. 128-653.0SC.
Horne, David M. Dispenser for refrigerated liquids. 5,024,353, Cl. 222-185.000.
Horner, Joseph L., to United States of America, Air Force. Amplitude encoded phase-only filters for optical correlators. 5,024,508, Cl. 350-162.130.
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Seki, Nobuyoshi; Morii, Nobuyuki; Sugiyama, Yoshihide; Komada, Takashi; Hosoi, Masatoshi; Hujiwara, Atuhisa; Ichinose, Tsutomu; Mori, Goro; Kikuchi, Toshiyuki; and Minato, Masahiro, 5,024,430, Cl. 270-53.000.
Hosoi, Osamu, to Matsushita Electric Industrial Co., Ltd. Video signal separating apparatus. 5,025,311, Cl. 358-31.000.
Hottenroth, Fred W.; and Hottenroth, Fred W., III, to ZZ Corp. Portable stove. 5,024,208, Cl. 126-25.00R.
Hottenroth, Fred W., III: *See*—
Hottenroth, Fred W.; and Hottenroth, Fred W., III, 5,024,208, Cl. 126-25.00R.
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Howard, John B.: *See—*
Raikes, Terry E.; Kramer, William L.; Howard, John B.; Moore, Wayne D.; Jackson, Louis; and Kotecki, Jeffrey D., 5,024,282, Cl. 177-25.150.
Howe, Michael A.: *See—*
Blakely, Lawrence W.; Howe, Michael A.; Pinholster, Daniel F., Jr.; Terry, Claude E.; and McIntosh, Robert H., Sr., 5,024,840, Cl. 424-404.000.
Howe, Roger T.: *See—*
Tang, William C.; and Howe, Roger T., 5,025,346, Cl. 361-283.000.
Howell, Charles N., to Ajax Magnethermic Corporation. Induction heater with axially-aligned coils. 5,025,122, Cl. 219-10.710.
Howells, Richard D.: *See—*
Crater, Davis H.; Howells, Richard D.; Stern, Richard M.; and Temperante, John A., 5,025,052, Cl. 524-104.000.
Hoyloak, Joel N.: *See—*
Sohner, Harold K.; Hoyloak, Joel N.; Girvin, Richard J.; and Kumar, Surinder, 5,025,452, Cl. 375-1.000.
Hsieh, Kin H. Hub assembly of a bicycle and the like. 5,024,121, Cl. 74-594.100.
Hsieh, Shi-Nan. Protection device for use on electricity socket. 5,024,603, Cl. 439-148.000.
Hsu, Tsui-Chen: *See—*
Hung, Shih-Ho; and Hsu, Tsui-Chen, 5,024,412, Cl. 248-343.000.
Huang, Catherine C.: *See—*
Casper, Daniel F.; Flanagan, John R.; Gregg, Thomas A.; Huang, Catherine C.; and Kalos, Matthew J., 5,025,458, Cl. 375-114.000.
Huang, En L. Compactly foldable automobile sunshade. 5,024,262, Cl. 160-370.200.
Huang, Tien-Tsai. Tire pressure indicator. 5,025,244, Cl. 340-442.000.
Hubel, Egon, to Schering Aktiengesellschaft. Method of and device for compensating variations of branch currents in electroplating baths. 5,024,732, Cl. 204-1.110.
Huber, Ernst, to J.E. Love Company; and Agro Forest Technik North America, Inc., a part interest. Plant seedling holding and dispensing mechanism. 5,024,172, Cl. 111-104.000.
Hudson, Kevin R., to Hewlett-Packard Company. Graphics scaling method for high resolution printers. 5,025,325, Cl. 358-447.000.
Hudspeth, James P.: *See—*
Doherty, Annette M.; Hudspeth, James P.; Kaltenbronn, James S.; Repine, Joseph T.; Roark, William H.; Sircar, Ila; and Tinney, Francis J., 5,024,994, Cl. 514-18.000.
Huff, George A.: *See—*
Kaminsky, Mark P.; Kleefisch, Mark S.; Huff, George A.; Washecheck, Don M.; Alvarado-Swaisgood, Aileen E.; and Barr, Mark K., 5,024,984, Cl. 502-303.000.
Hughes Aircraft Company: *See—*
Backes, Peter G., 5,024,080, Cl. 73-54.000.
Garcia, Gilbert; and Domnikov, Larissa, 5,025,068, Cl. 525-119.000.
Hatfield, Dean C., Jr., 5,025,149, Cl. 250-342.000.
Leonakis, George L., 5,025,233, Cl. 333-128.000.
Rogers, Howard H.; and Herrin, Jerry J., 5,025,119, Cl. 200-262.000.
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Seki, Nobuyoshi; Morii, Nobuyuki; Sugiyama, Yoshihide; Komada, Takashi; Hosoi, Masatoshi; Hujiwara, Atuhisa; Ichinose, Tsutomu; Mori, Goro; Kikuchi, Toshiyuki; and Minato, Masahiro, 5,024,430, Cl. 270-53.000.
Hulden, Fritiof, to Svets- & Maskinprodukter i Lidkoping AB. Device in a quick coupling. 5,024,010, Cl. 37-118.00R.
Hull, Edwin J., Jr.; and Johnson, Charles R. Anti-theft locking apparatus for steering wheels. 5,024,069, Cl. 70-209.000.
Hulsman, Severien; and Salemink, Johannes H. A. G., to Turmac Tobacco Company B.V. Method and apparatus for manufacturing a rod of tobacco or the like enclosed by a paper strip, and cigarette manufactured by said method. 5,024,241, Cl. 131-84.200.
Hung, Shih-Ho; and Hsu, Tsui-Chen, to Llama Precision Inc. Hanger assembly. 5,024,412, Cl. 248-343.000.
Hung, Vincent: *See—*
Bennett, Robert B.; Hung, Vincent; and Sassoon, Ezra, 5,023,979, Cl. 24-68.00R.
Hurinville, Bertrand, to Alcatel Transmission par Faisceaux Hertziens. Method of measuring the signature of digital transmission equipment, and apparatus for implementing such a method. 5,025,453, Cl. 375-10.000.
Hutchinson: *See—*
Busnel, Rene-Guy; and Argy, Gilles, 5,024,852, Cl. 427-2.000.
Hutchinson, Martin A.: *See—*
Turner, Frederick T.; Hutchinson, Martin A.; Shaw, R. H.; and Lamont, Lawrence T., Jr., 5,024,747, Cl. 204-298.090.
Huvenaars, Peter J. M.: *See—*
Rischke, Jorg W.; Loermans, Peter J. G.; and Huvenaars, Peter J. M., 5,024,745, Cl. 204-198.000.
Hwo, Charles C.; and Mostert, Simone, to Shell Oil Company. Modified polybutylene-base hot melt compositions. 5,024,888, Cl. 428-355.000.
Hyde, Phillip M.: *See—*
Cox, Vernon F.; and Hyde, Phillip M., 5,024,632, Cl. 464-33.000.
Hydromatik GmbH: *See—*
Schniederjan, Reinhold, 5,024,143, Cl. 92-12.200.
Hydroquip Technologies, Inc.: *See—*
McGrath, Thomas M.; and Tilles, Arno W., 5,024,759, Cl. 210-222.000.
Hyodo, Kenji: *See—*
Katsura, Toru; Kaji, Hiroo; Hyodo, Kenji; and Ohkura, Hirokazu, 5,024,986, Cl. 503-200.000.
Ichikawa, Hiroshi, to Nippon Carbon Co., Ltd.; Sogo Security Services Co.; and Hiroaki Yanagida. Infrared detective element. 5,025,243, Cl. 338-18.000.
Ichikawa, Junichi: *See—*
Kawakami, Shin; Nikaido, Katsutomo; and Ichikawa, Junichi, 5,025,116, Cl. 174-250.000.
Ichinose, Tsutomu: *See—*
Seki, Nobuyoshi; Morii, Nobuyuki; Sugiyama, Yoshihide; Komada, Takashi; Hosoi, Masatoshi; Hujiwara, Atuhisa; Ichinose, Tsutomu; Mori, Goro; Kikuchi, Toshiyuki; and Minato, Masahiro, 5,024,430, Cl. 270-53.000.
ICI Americas Inc.: *See—*
Greenshields, James N.; and Tetlow, Peter E., 5,024,821, Cl. 423-23.000.
Nagubandi, Sreeramulu, 5,024,691, Cl. 71-86.000.
Ide, Tetsuya, to Terumo Kabushiki Kaisha. Detachable probe-type electronic clinical thermometer. 5,024,622, Cl. 439-829.000.
Ide, Yukio: *See—*
Yamada, Katsuyuki; Ide, Yukio; Harigaya, Makoto; and Iwasaki, Hiroko, 5,024,927, Cl. 430-495.000.
Idel, Karsten-Josef: *See—*
Tacke, Peter; Grigo, Ulrich; Nouvertne, Werner; Freitag, Dieter; Idel, Karsten-Josef; and Westeppe, Uwe, 5,025,065, Cl. 524-611.000.
Identification Technology Corporation: *See—*
Hayes, Norman J.; and Avedon, Raymond B., 5,024,013, Cl. 40-301.000.
Idoshita, Takuya: *See—*
Futatasuka, Rensei; Koshiba, Yutaka; Chiba, Shunich; Orikasa, Toyoaki; Noguchi, Seiji; and Idoshita, Takuya, 5,024,814, Cl. 420-473.000.
Igarashi, Eiji; Imamiya, Susumu; and Suzuki, Yasuo, to Yokohama Rubber Co., Ltd., The. Heavy duty pneumatic radial tire with improved steel cord belt. 5,024,261, Cl. 152-527.000.
Iguchi, Yoshihiro: *See—*
Ueda, Mitsuru; Kanno, Tatsuya; Iguchi, Yoshihiro; and Oshino, Yasuhiro, 5,025,083, Cl. 528-199.000.
Ihata, Jyoji: *See—*
Shimamura, Yasuki; and Ihata, Jyoji, 5,025,266, Cl. 346-1.100.
Iida, Shinzi; Takeya, Fuminori; and Aoki, Shinya, to NGK Insulators, Ltd. Magnetic head core utilizing a non-magnetic layer. 5,025,343, Cl. 360-127.000.
Ilyama, Kiyotaka; Hayakawa, Kunio; Nakata, Masahiro; Kodera, Kaoru; and Miyazaki, Osamu, to Ricoh Company, Ltd. Leuco dyes and recording materials using the same. 5,024,699, Cl. 106-21.000.
Ikeda, Masami: *See—*
Yamanari, Masaya; and Ikeda, Masami, 5,025,484, Cl. 382-61.000.
Ikegami, Tetsuhiko: *See—*
Sudo, Shoichi; Sakai, Yoshihisa; Yasaka, Hiroshi; Ikegami, Tetsuhiko; Yoshikuni, Yuzo; Yokohama, Itaru; and Kubodera, Kenichi, 5,025,448, Cl. 372-32.000.
Ikemoto, Hiroyuki: *See—*
Kokubo, Kouichi; Hamada, Toshiaki; Tagawa, Shinichi; Suzumura, Nobuyasu; Buma, Shuuichi; Aburaya, Toshio; Onuma, Toshio; Sato, Kunihito; Yonekawa, Takashi; Kawanishi, Masaki; Ikemoto, Hiroyuki; and Ohashi, Kaoru, 5,024,459, Cl. 280-707.000.
Ilmatera OY: *See—*
Laine, Juhani; Nyman, Mikko; and Paananen, Tapio, 5,024,263, Cl. 165-1.000.
Ilvespaa, Heikki: *See—*
Kuhasalo, Antti; Viitanen, Olavi; and Ilvespaa, Heikki, 5,024,729, Cl. 162-372.000.
Imai, Hitoshi: *See—*
Takokoro, Michihiro; Okada, Kazuo; and Imai, Hitoshi, 5,025,430, Cl. 369-13.000.
Imai, Toshiaki, to Kabushiki Kaisha Toshiba. Method of analyzing reaction rate in chemical analysis. 5,025,389, Cl. 364-497.000.
Imaizumi, Tomoaki: *See—*
Fujie, Naofumi; Imaizumi, Tomoaki; Ito, Koji; and Okada, Shoji, 5,025,187, Cl. 310-323.000.
Imamiya, Susumu: *See—*
Igarashi, Eiji; Imamiya, Susumu; and Suzuki, Yasuo, 5,024,261, Cl. 152-527.000.
Imperial Chemical Industries PLC: *See—*
Brattan, Keith, 5,024,788, Cl. 261-114.100.
Kennedy, David L.; True, Donald C.; and Welsh, David M., 5,024,158, Cl. 102-275.110.
Impink, Albert J., Jr.; Grobmyer, Louis R.; Sariscak, Robert E.; Morita, Toshio; and Duryea, John L., to Westinghouse Electric Corp. Reactor core model update system. 5,024,801, Cl. 376-217.000.
Inada, Hitoshi: *See—*
Kanno, Tetsuo; Kotake, Yasushi; and Inada, Hitoshi, 5,025,339, Cl. 360-99.060.
Inada, Masanori; and Ohtani, Hichiro, to Mitsubishi Denki Kabushiki Kaisha. Terminal flow sensor. 5,024,083, Cl. 73-204.260.
Inagaki, Motoshi: *See—*
Funato, Ryo; Takahiro, Syuji; Yoshida, Keiji; Kubo, Shinji; and Inagaki, Motoshi, 5,024,914, Cl. 430-109.000.
Indiana Mills & Manufacturing, Inc.: *See—*
Anthony, James R.; Wiseman, Michael A.; and Lortz, Allan R., 5,023,981, Cl. 24-573.500.

Industria Grafica Meschi S.r.l.: *See*—
Meschi, Luciano, 5,024,576, Cl. 414-786.000.
Industrial Farmaceutica Serono SpA: *See*—
Del Bianco, Sergio; and Sica, Gigliola, 5,024,833, Cl. 424-85.400.
Inge, Claes; Franzen, Peter; Lagerstedt, Torgny; Borgstrom, Leonard; Carlsson, Claes-Goran; Moberg, Hans; and Nåbo, Olle, to Alfa-Laval Separation AB. Centrifugal separator with a discharge device. 5,024,648, Cl. 494-56.000.
Injection Research Specialists, Inc.: *See*—
Gatza, Ward K.; and Chasteen, Ronald E., 5,024,205, Cl. 123-632.000.
Injet Medical Products, Inc.: *See*—
Gasaway, Jack S.; Parsons, J. Stuart; and Harshman, Robert L., 5,024,656, Cl. 604-70.000.
Ink Company, The: *See*—
Britton, William E., Jr., 5,024,700, Cl. 106-32.000.
Inlow, Duane; and Maiorella, Brian, to Cetus Corporation. Serum free media for the growth on insect cells and expression of products thereby. 5,024,947, Cl. 435-240.310.
Inness, Keith W.: *See*—
Hanson, Gary N.; and Inness, Keith W., 5,024,035, Cl. 52-591.000.
Innovative Metal Inc.: *See*—
Hayward, James E., 5,024,167, Cl. 108-50.000.
Inose, Hiroshi: *See*—
Sato, Isao; Kirikami, Seiichi; Shimura, Akira; Hirose, Fumiyuki; Inose, Hiroshi; Urushidani, Haruo; and Arai, Osamu, 5,024,055, Cl. 60-39.270.
Inoue, Haruki; Funabashi, Motohisa; Yahiro, Masakazu; and Tanaka, Fumiki, to Hitachi, Ltd.; and Hitachi Engineering Co., Ltd. Process control method and control system. 5,025,499, Cl. 364-165.000.
Inoue, Hiroshi: *See*—
Etoh, Yoshiyuki; Inoue, Hiroshi; Mori, Kazuyuki; Suzuki, Koichi; Nakano, Kinichiro; Nomura, Hiroyuki; Yamamoto, Isao; and Yoshida, Kiyoshi, 5,025,379, Cl. 364-426.040.
Inoue, Kazuhiko: *See*—
Tomisawa, Yutaka; Fukuda, Toshikazu; and Inoue, Kazuhiko, 5,025,305, Cl. 357-72.000.
Inoue, Manabu: *See*—
Taniguchi, Nobuyuki; Hata, Yoshiaki; Kudo, Yoshinobu; Inoue, Manabu; Hoda, Takeo; and Ueda, Hiroshi, 5,025,275, Cl. 354-106.000.
Inoue, Takashi; Suzuki, Tatsuya; Kimura, Akiteru; Miyazaki, Hiroaki; and Katagiri, Moriya, to Olympus Optical Co., Ltd.; and Olympus Optical Co., Ltd. Camera with focal point switching mechanism. 5,025,277, Cl. 354-173.100.
Insley, Thomas I., to Minnesota Mining and Manufacturing Company. Sorbent, impact resistant container. 5,024,865, Cl. 428-36.400.
Institut Francais du Petrole: *See*—
Cameron, Charles; Mimoun, Hubert; Robine, Alain; Bonnaudet, Serge; Chaumette, Patrick; and Dang Vu, Quang, 5,025,108, Cl. 585-500.000.
Giuliani, Pierre; Le Page, Jean-Francois; Plumail, Jean-Claude; and Espaillac, Marcellin, 5,024,751, Cl. 208-108.000.
Insulock Corporation: *See*—
Hanson, Gary N.; and Inness, Keith W., 5,024,035, Cl. 52-591.000.
Integrated Network Corporation: *See*—
Gupta, Dev V., 5,025,443, Cl. 370-76.000.
Interface, Inc.: *See*—
Blakely, Lawrence W.; Howe, Michael A.; Pinholster, Daniel F., Jr.; Terry, Claude E.; and McIntosh, Robert H., Sr., 5,024,840, Cl. 424-404.000.
International Business Machines Company: *See*—
Durig, Urs T.; Fischer, Ulrich C.; and Pohl, Wolfgang D., 5,025,147, Cl. 250-216.000.
International Business Machines Corporation: *See*—
Brooks, Peter E., 5,025,337, Cl. 360-97.030.
Casper, Daniel F.; Flanagan, John R.; Gregg, Thomas A.; Huang, Catherine C.; and Kalos, Matthew J., 5,025,458, Cl. 375-114.000.
Chen, Chengjun J., 5,024,725, Cl. 156-643.000.
Dinan, Raymond F.; Fallon, Hugh C.; Malin, Jerald R.; Rodite, Robert R.; Rohe, Clair F.; and Rohrer, Gene D., 5,025,483, Cl. 382-58.000.
Harame, David L.; and Stork, Johannes M. C., 5,024,957, Cl. 437-31.000.
Mathad, Gangadhara S.; Stanasolovich, David; and Via, Giorgio G., 5,024,896, Cl. 428-473.500.
Mueller, Wolfgang F.; Popp, George; and Vandergheynst, George B., 5,024,127, Cl. 83-13.000.
Parks, Carol A.; Probst, Robert E.; Rajagopal, Doraiswamy; and Youngs, Gary L., 5,025,396, Cl. 364-518.000.
International Computers Limited: *See*—
Stevens, Reginald W., 5,025,256, Cl. 341-59.000.
International Medication Systems, Limited: *See*—
Ogle, George Braddock, II, 5,024,616, Cl. 604-192.000.
International Paper: *See*—
Edwards, James C.; and Pritchard, Edward E., 5,024,397, Cl. 294-68.230.
Inuzuka, Yutaka: *See*—
Yamada, Ichiji; Inuzuka, Yutaka; Murakami, Michiyuki; Suzuki, George; Tanahashi, Tyo; and Kondo, Takeshi, 5,024,117, Cl. 74-473.00P.
Iorns, Martin E. Method and apparatus for constructing an offshore hollow column. 5,024,557, Cl. 405-223.000.
Iowa State University Research Foundation, Inc.: *See*—
Chriswell, Colin D.; Markuszewski, Richard; and Buttermore, William H., 5,024,753, Cl. 209-1.000.
Misra, Manjit K.; and Shyy, Yuh-Yuan, 5,024,334, Cl. 209-557.000.
Ip, Stephen H.: *See*—
Brenner, Michael B.; Strominger, Jack L.; Seidman, Jonathan; Ip, Stephen H.; and Krangel, Micahel S., 5,024,940, Cl. 435-69.100.
Ippolito, Guy F.; and Spector, George. All in one drill bit. 5,024,566, Cl. 408-197.000.
Ire-Celltarg S.A.: *See*—
Rao, KSP Siva Bhushana; Dejonghe, Jean-Paul; Collard, Marie-Paule; and Trouet, Andre, 5,024,835, Cl. 424-85.910.
Isbert, Jacques: *See*—
Maisonneuve, Jean-Michel; Domergue, Jean-Paul; Parize, Gabrielle; Palandjian, Philippe; and Isbert, Jacques, 5,024,502, Cl. 350-96.160.
Ishidoya, Masahiro; Soma, Toru; and Ogawa, Hisao, to Nippon Oil and Fats Co., Ltd. Aqueous dispersion coating material. 5,025,061, Cl. 524-539.000.
Ishii, Akihiko; Honda, Yukihiro; and Matsui, Toshio, to Mitsubishi Denki Kabushiki Kaisha. Solar cell power system with a solar array bus lockup cancelling mechanism. 5,025,202, Cl. 320-32.000.
Ishii, Yoichi; and Mihara, Hisashi, to Eimei Company, Ltd. Process for the production of dried earthworm powder and antihyperlipemic, antidiabetic, antihypertensive and antihypotensive preparations containing dried earthworm powder as active ingredient. 5,024,844, Cl. 424-520.000.
Ishimura, Toshihiko; Okuno, Akira; Tänii, Junichi; and Seki, Reiji, to Minolta Camera Kabushiki Kaisha. Electromagnetic actuator for cameras and the like. 5,025,239, Cl. 335-265.000.
Ishizuki, Tomonori: *See*—
Komaki, Toshihiro; Kudo, Hideo; Ishizuki, Tomonori; and Yokozeki, Shinichi, 5,025,439, Cl. 369-100.000.
Isnardi, Michael A., to RCA Licensing Corporation. Extended definition widescreen television signal processing system. 5,025,309, Cl. 358-12.000.
Isover Saint-Gobain: *See*—
Tetart, Serge; and Lericque, Bernard, 5,025,077, Cl. 528-86.000.
Isukimi, Hayatsugu; and Kikuchi, Reiji, to Mazda Motor Corporation. Front body structure of automotive vehicle. 5,024,482, Cl. 296-194.000.
Isuzu Motors Limited: *See*—
Kawamura, Hideo, 5,024,057, Cl. 60-597.000.
Tanaka, Koji; and Shima, Takashi, 5,024,489, Cl. 303-3.000.
Itakura, Katsuhiko: *See*—
Masuyama, Masaru; Takemae, Yoshihiro; Endoh, Tetsuhiko; Komyoji, Hirosuke; Tanaka, Ryuji; and Itakura, Katsuhiko, 5,025,415, Cl. 365-52.000.
Itaya, Masahiko: *See*—
Shoji, Hisashi; Tamura, Akihiko; Itaya, Masahiko; Fuma, Hiroshi; and Soma, Shinobu, 5,024,181, Cl. 118-658.000.
Ito, Hideyoshi: *See*—
Iwabuchi, Masaburo; Ito, Hideyoshi; and Unetsubo, Kenji, 5,024,867, Cl. 428-40.000.
Ito, Kazuo. Automobile window opening and closing device. 5,024,022, Cl. 49-139.000.
Ito, Kiyoshi, to Komori Printing Machinery Co., Ltd. Transfer roller switching mechanisms of ink and water supply apparatus for use in printing presses. 5,024,154, Cl. 101-148.000.
Ito, Koji: *See*—
Fujie, Naofumi; Imaizumi, Tomoaki; Ito, Koji; and Okada, Shoji, 5,025,187, Cl. 310-323.000.
Ito, Masato: *See*—
Morishita, Hajime; Hayashi, Nobuaki; Nonogaki, Saburo; Hashimoto, Michiaki; Ito, Masato; Nishizawa, Masahiro; Miura, Kiyo-shi; and Odaka, Yoshiyuki, 5,024,920, Cl. 430-325.000.
Ito, Michio: *See*—
Miyakawa, Shinji; and Ito, Michio, 5,024,461, Cl. 280-710.000.
Ito, Shigehiro: *See*—
Koguchi, Tatsushi; Ito, Shigehiro; Ebihara, Kazyuki; and Nishi, Yuji, 5,025,317, Cl. 358-167.000.
Ito, Toshifumi; Ohta, Atsuo; and Yamashita, Shoji, to Honda Giken Kogyo Kabushiki Kaisha. Reverse drive for vehicle. 5,024,113, Cl. 74-6.000.
Ito, Yoichiro, to United States of America, Health and Human Services. Horizontal flow-through coil planet centrifuge with multilayer plural coils in eccentric synchronous rotation, suitable for counter-current chromatography. 5,024,758, Cl. 210-198.200.
Itoh, Hisato; Enomoto, Katashi; Oguchi, Takahisa; and Nishizawa, Tsutomu, to Mitsui Toatsu Chemicals, Incorporated; and Yamamoto Chemicals, Incorporated. Alkylphthalocyanine near-infrared absorbers and recording/display materials using the same. 5,024,926, Cl. 430-495.000.
Itoh, Takashi; and Katoh, Katsuaki, to N. E. Chemcat Corporation. Platinum alloy electrocatalyst. 5,024,905, Cl. 429-44.000.
Iwabuchi, Masaburo; Ito, Hideyoshi; and Unetsubo, Kenji, to Kabushiki Kaisha Toshiba. Dopant film and methods of diffusing impurity into and manufacturing a semiconductor wafer. 5,024,867, Cl. 428-40.000.
Iwamoto, Shinichi, to NEC Corporation. Serial bus interface capable of transferring data in different formats. 5,025,414, Cl. 364-900.000.
Iwanaga, Kenji: *See*—
Yamazaki, Syoji; Oda, Toshikazu; Iwanaga, Kenji; and Gono, Yoshitaka, 5,025,237, Cl. 335-83.000.
Iwasa, Nobuhiko. Wave dissipating caisson and method for producing thereof. 5,024,796, Cl. 264-69.000.
Iwasaki, Hiroko: *See*—
Yamada, Katsuyuki; Ide, Yukio; Harigaya, Makoto; and Iwasaki, Hiroko, 5,024,927, Cl. 430-495.000.

Iwasaki, Hiroshi: *See*—
Fujikawa, Yoshihiro; Suzuki, Mikio; Iwasaki, Hiroshi; Sakashita, Mitsuaki; and Kirahara, Masaki, 5,024,999, Cl. 514-63.000.
Iwata, Masataka: *See*—
Ushio, Sadakatsu; Nakamura, Noboru; Higashi, Hirofumi; Iwata, Masataka; and Niwa, Fumiyasu, 5,024,189, Cl. 123-195.00R.
Iwatsu Electric Company, Ltd.: *See*—
Kamigaki, Masaharu; Oshikata, Hironobu; Kawata, Yoshihiro; Shiga, Nobuyasu; Omori, Hideharu; Kawashima, Masayuki; and Shimatani, Toshimichi, 5,025,441, Cl. 370-77.000.
Izawa, Nobu: *See*—
Shindo, Masamichi; Sakurai, Toshiharu; Taguchi, Hideo; and Izawa, Nobu, 5,025,347, Cl. 361-386.000.
J.E. Love Company: *See*—
Huber, Ernst, 5,024,172, Cl. 111-104.000.
Jabs, Gert: *See*—
Klug, Gunter; Jabs, Gert; Berneth, Horst; and Botta, Artur, 5,024,987, Cl. 503-211.000.
Jackman, William E. Insert for a hydro pole switch. 5,025,120, Cl. 200-49.000.
Jackovitz, John F.: *See*—
Snyder, Thomas S.; Jackovitz, John F.; and Ferrari, Harry M., 5,024,749, Cl. 204-299.00R.
Jackson, Allen L.: *See*—
Sikand, Parminder S.; McAllister, Mary J.; Henel, John; Jackson, Allen L.; and Bell, Karen, 5,025,468, Cl. 379-67.000.
Jackson, Louis: *See*—
Raikes, Terry E.; Kramer, William L.; Howard, John B.; Moore, Wayne D.; Jackson, Louis; and Kotecki, Jeffrey D., 5,024,282, Cl. 177-25.150.
Jackson, William E., to Donaldson Company, Inc. Method for potting pleated filter media and filters made thereby. 5,024,870, Cl. 428-181.000.
Jaeger, Hugh D., to W. R. Grace & Co.-Conn. Radio frequency air float bar. 5,024,004, Cl. 34-1.000.
Jahn, Hans-Georg, to Heidelberger Druckmaschinen AG. Finger protecting element for cylinder nip. 5,024,155, Cl. 101-216.000.
Jahn, Manfred: *See*—
Hahn, Walter; Lutz, Ferdinand; and Jahn, Manfred, 5,024,115, Cl. 74-89.150.
Jahnke, Kenneth C.: *See*—
Buchman, James E.; and Jahnke, Kenneth C., 5,024,642, Cl. 493-193.000.
Jakobson, Gerald; Siemanowski, Werner; and Uhlig, Karl-Heinz, to Deutsche Solvay-Werke GmbH. Process for the preparation of fatty acid or hydroxy fatty acid esters of isopropylidene derivatives of polyglycerols. 5,024,787, Cl. 260-410.600.
James, Bertram G., to Varian Associates, Inc. Beam collector with low electrical leakage. 5,025,193, Cl. 315-5.380.
Jamieson, Donald R.: *See*—
Zupancic, Joseph J.; Swedo, Raymond J.; Jamieson, Donald R.; Schumacher, Elaine F.; and Buehler, Allyson J., 5,025,079, Cl. 528-170.000.
Janas, Victor F.: *See*—
Allaire, Roger A.; Friske, Mark S.; Hagg, Sandra L.; and Janas, Victor F., 5,024,978, Cl. 501-95.000.
Jansen, Michael; Sergant, Moshe; Ou, Szutsun S.; Wilcox, Jaroslava Z.; Yang, Jane J.; and Eaton, Larry R., to TRW Inc. Two-dimensional integrated laser array. 5,025,451, Cl. 372-50.000.
Janssen, Augustus J. E. M.; Veldhuis, Raymond N. J.; Prins, Hendrik J.; and Vries, Lodewijk B., to U.S. Philips Corporation. Method of correcting erroneous values of samples of an equidistantly sampled signal and device for carrying out the method. 5,025,404, Cl. 364-723.000.
Janssen Pharmaceutica N.V.: *See*—
Janssens, Frans E.; Torremans, Joseph L. G.; and Hens, Jozef F., 5,025,014, Cl. 514-258.000.
Janssens, Frans E.; Torremans, Joseph L. G.; and Hens, Jozef F., to Janssen Pharmaceutica N.V. Bicyclic heterocyclyl containing N-(bicyclic heterocyclyl)-4-piperidinamines as pharmaceuticals. 5,025,014, Cl. 514-258.000.
Japan Defense Agency: *See*—
Yasui, Yoshiharu; Anahara, Meiji; Asahi, Goro; and Miyake, Shiro, 5,024,874, Cl. 428-257.000.
Japan Electronic Control Systems Co., Ltd.: *See*—
Kobayashi, Kazumitsu; and Sunou, Hiroki, 5,024,201, Cl. 123-531.000.
Jarochowski, Wit. Electromagnetic escapement for mechanically driven watch or clock. 5,025,428, Cl. 368-126.000.
Jarry, Jacques: *See*—
Gloanec, Maurice; Jarry, Jacques; and Lailler, Jean L., 5,025,212, Cl. 324-158.00R.
Jaspers, Martinus J.: *See*—
Van Der Hoorn, Rudolf J.; Jaspers, Martinus J.; and Bak, Johannes J., 5,023,975, Cl. 17-46.000.
Jay, Jerry L., Sr.; and Holifield, William R., III. Pneumatic desedimentation machine improvement. 5,024,245, Cl. 134-108.000.
Jebens, Robert W., to AT&T Bell Laboratories. Shape memory alloy optical fiber switch. 5,024,497, Cl. 350-96.200.
Jeffers, Frederick J., to Eastman Kodak Company. Radiographic imaging screen. 5,025,163, Cl. 250-483.100.
Jeffries, Alfred T., III: *See*—
Blakeney, Andrew J.; Jeffries, Alfred T., III; and Sarubbi, Thomas R., 5,024,921, Cl. 430-326.000.
Jerie, Hans G., to Ambridge Limited. Map projection system. 5,024,523, Cl. 353-11.000.
Jetzer, Gregor; Kolb, Roland; and Spinnler, Fritz, to Asea Brown Boveri Ltd. Spiral displacement machine having a lubricant system. 5,024,589, Cl. 418-55.300.
JI. Case Corporation: *See*—
Warner, Steven D.; and Stufflebeam, John F., 5,024,279, Cl. 172-1.000.
Jidoshi Denki Kogyo K.K.: *See*—
Sekine, Shuji; and Harada, Naoto, 5,025,184, Cl. 310-71.000.
JMK International, Inc.: *See*—
Gibbon, Robert M., 5,024,863, Cl. 427-387.000.
JML Communications, Inc.: *See*—
Keyser, George T., Jr.; Fosler, Carl R.; and Johnson, Jeffrey D., 5,025,373, Cl. 364-408.000.
Johary, Arun; and Rosenau, Mark A., to Chips and Technologies, Inc. Method and apparatus for scaling interlaced images. 5,025,315, Cl. 358-140.000.
Johns Hopkins University, The: *See*—
Hogrefe, Arthur F., 5,025,454, Cl. 375-41.000.
Johnson, Brian: *See*—
Wendt, Richard W.; and Johnson, Brian, 5,025,399, Cl. 364-519.000.
Johnson, Charles R.: *See*—
Hull, Edwin J., Jr.; and Johnson, Charles R., 5,024,069, Cl. 70-209.000.
Johnson, Chris A.: *See*—
Howard, Dwight L.; and Johnson, Chris A., 5,024,519, Cl. 351-226.000.
Johnson, David W. Interlocking support structures. 5,024,036, Cl. 52-600.000.
Johnson, Jeffrey D.: *See*—
Keyser, George T., Jr.; Fosler, Carl R.; and Johnson, Jeffrey D., 5,025,373, Cl. 364-408.000.
Johnson, Marvin M.: *See*—
Tooley, Patricia A.; Cheung, Tin-Tack P.; Cymbaluk, Ted H.; Nowack, Gerhard P.; and Johnson, Marvin M., 5,024,683, Cl. 55-74.000.
Johnson, Randall E.; and Drumm, James M., to Texas Instruments Incorporated. Assembly of semiconductor chips. 5,025,306, Cl. 357-75.000.
Johnson, Ronald E.: *See*—
Grossman, David G.; Karnas, Michael A.; and Johnson, Ronald E., 5,024,790, Cl. 264-16.000.
Johnson Service Company: *See*—
Van Fossen, Robert A.; Spence, Scott L.; and DeWitt, Donald E., 5,024,294, Cl. 184-108.000.
Johnston, William H., to CSL Group Inc., The. Bulk material reclaiming apparatus. 5,024,568, Cl. 414-142.200.
Jones, Graham P.: *See*—
Gates, Peter S.; and Jones, Graham P., 5,024,693, Cl. 71-92.000.
Jones, Ralph W., Jr.: *See*—
Evans, Francis J.; Jones, Ralph W., Jr.; and Wilson, Robert D., 5,024,931, Cl. 430-567.000.
Jones, Robert L.; and Wilson, Norman H., to National Research Development Corporation. Prostaglandins. 5,025,034, Cl. 514-529.000.
Jones, William J.; and Appleyard, Ian P., to Tioxide Group, PLC. Fine particulate material. 5,024,827, Cl. 423-610.000.
Jorissen, Steven A.; Lundy, Charles E.; Krishnan, Sivaram; Mafoti, Robson; and Pyles, Robert A., to Mobay Corporation. Thermoplastic compositions having improved melt flow. 5,025,056, Cl. 524-310.000.
Joseph, William A., Jr.: *See*—
Fortmann, Robert C.; Pinnow, Curtis C.; Kuschewski, Gustav; and Joseph, William A., Jr., 5,025,132, Cl. 219-401.000.
Jou, Huey-Ling L.: *See*—
Yang, Huey-Lang; Todd, John; and Jou, Huey-Ling L., 5,024,933, Cl. 435-6.000.
Jouillat, Claude; and Brunet, Michel, to Societe Technique de Pulverisation—STEP. Device for dispensing a liquid or a cream in small-volume drops, and an associated dispensing assembly. 5,024,355, Cl. 222-162.000.
Jubin, Robert T.; and Randolph, John D., to United States of America, Energy. Centrifugal contactor with liquid mixing and flow control vanes and method of mixing liquids of different phases. 5,024,647, Cl. 494-37.000.
Jude, Arthur D. Transmitter in arrow. 5,024,447, Cl. 273-416.000.
Juhlke, Timothy J.: *See*—
Lagow, Richard J.; Bierschenk, Thomas R.; Juhlke, Timothy J.; and Kawa, Hajimu M., 5,025,093, Cl. 568-601.000.
Junji; and Tamura, Fumiaki. Array splice for ribbon-like multi-core optical fibers. 5,024,505, Cl. 350-96.220.
Juridical Foundation The Chemo-Sero-Therapeutic Research Institute: *See*—
Nozaki, Chikateru; Miyanohara, Atsushi; Hamada, Fukusaburo; Ohtomo, Nobuya; and Matsubara, Kenichi, 5,024,938, Cl. 435-68.100.
Juriga, James A.: *See*—
Oliver, James L.; Juriga, James A.; Walton, Erlen B.; and Preston, David M., 5,024,463, Cl. 280-718.000.
Kabushiki Kaisha Shinkawa: *See*—
Terakado, Yoshimitsu; and Yamazaki, Nobuto, 5,024,367, Cl. 228-111.000.
Kabushiki Kaisha Toshiba: *See*—
Asoh, Syoichi, 5,025,418, Cl. 365-200.000.
Imai, Toshiaki, 5,025,389, Cl. 364-497.000.
Iwabuchi, Masaburo; Ito, Hideyoshi; and Unetsubo, Kenji, 5,024,867, Cl. 428-40.000.
Kondo, Hitoshi; Suwabe, Hiroyuki; and Kojima, Aiki, 5,025,230, Cl. 331-116.0FE.

Miyamoto, Junichi; Ohtsuka, Nobuaki; Yoshikawa, Kuniyoshi; and Mori, Seiichi, 5,025,417, Cl. 365-189.090.
Miyata, Yukitaka; Wada, Hiroyuki; and Nishimura, Takashi, 5,025,166, Cl. 250-492.100.
Okabe, Yoshie, 5,025,475, Cl. 382-1.000.
Saito, Yasuo; Fujimoto, Seiji; Nobuta, Yasuo; and Yamazaki, Masahiko, 5,025,462, Cl. 378-19.000.
Saito, Yasuo; Yahata, Mitsuru; Honjo, Kouji; and Matsubayashi, Takayuki, 5,025,463, Cl. 378-19.000.
Shimmyo, Takashi, 5,025,326, Cl. 358-498.000.
Shindo, Masamichi; Sakurai, Toshiharu; Taguchi, Hideo; and Izawa, Nobu, 5,025,347, Cl. 361-386.000.
Sugawara, Michitaka, 5,025,375, Cl. 364-413.220.
Taketani, Mitsuhiro, 5,024,544, Cl. 400-692.000.
Tomisawa, Yutaka; Fukuda, Toshikazu; and Inoue, Kazuhiko, 5,025,305, Cl. 357-72.000.
Yaguchi, Toshiyuki, 5,025,210, Cl. 324-158.00R.
Yamanari, Masaya; and Ikeda, Masami, 5,025,484, Cl. 382-61.000.
Yamashita, Hiroshi; Tago, Yoshiaki; and Yoshimaru, Tomohisa, 5,025,437, Cl. 369-79.000.

Kabushiki Kaisha Toyoda Jidoshokki: *See*—
Kawabata, Susumu; Yoshida, Kazunori; Kisanuki, Yoshikatsu; Suzuki, Hajime; and Shiraki, Masao, 5,024,253, Cl. 139-99.000.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Yasui, Yoshiharu; Anahara, Meiji; Asahi, Goro; and Miyake, Shiro, 5,024,874, Cl. 428-257.000.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Kawabata, Susumu; Yoshida, Kazunori; Kisanuki, Yoshikatsu; Suzuki, Hajime; and Shiraki, Masao, 5,024,253, Cl. 139-99.000.
Nagano, Susumu; Kawazoe, Hiromitsu; and Ohsawa, Katsuyuki, 5,024,184, Cl. 123-48.00R.

Kabushiki Kaisha Universal: *See*—
Okada, Kazuo, 5,024,439, Cl. 273-143.00R.

K.K. Sankto Seiki Seisakusho: *See*—
Komatsu, Fumito; Usuki, Hideo; and Oguchi, Yuzo, 5,024,088, Cl. 73-517.00B.

Kachlic, Jerry D., to Molex Incorporated. Grounding electrical connector. 5,024,607, Cl. 439-567.000.

Kaczmarczyk, Raymond A., Jr.: *See*—
Gerling, Joseph F.; and Kaczmarczyk, Raymond A., Jr., 5,024,356, Cl. 222-312.000.

Kada, Katsuhiko: *See*—
Suganuma, Katsuaki; Fujii, Hiroyuki; Minakuchi, Hiroyoshi; Kada, Katsuhiko; Osafune, Haruo; and Kanamaru, Kuniaki, 5,024,902, Cl. 428-633.000.

Kade, Alexander: *See*—
Shaw, Schuyler S.; Hallinan, Linda L.; Hammersmith, Robert J.; Schenk, Donald E.; DeHoff, Edward J.; and Kade, Alexander, 5,024,299, Cl. 188-156.000.

Kadija, Igor V. Method and apparatus for manufacturing interconnects with fine lines and spacing. 5,024,735, Cl. 204-15.000.

Kafka, Fred Y.: *See*—
Christeil, Lance A.; and Kafka, Fred Y., 5,025,044, Cl. 523-334.000.

Kagaani Elektroniikka OY: *See*—
Ritala, Risto; Laakso, Mikko; and Koponen, Jari, 5,025,154, Cl. 250-308.000.

Kagaya, Shinichi: *See*—
Kuruma, Kiyoshi; Abe, Masaki; Kagechika, Hiroshi; and Kagaya, Shinichi, 5,024,900, Cl. 428-626.000.

Kagechika, Hiroshi: *See*—
Kuruma, Kiyoshi; Abe, Masaki; Kagechika, Hiroshi; and Kagaya, Shinichi, 5,024,900, Cl. 428-626.000.

Kahl, W. Henry; Price, David E.; and Tsao, Nai-Cheng, to Rubbermaid Incorporated. Safety release latch. 5,024,471, Cl. 292-97.000.

Kahler, Jeffrey A., to Honeywell Inc. Horizontal stabilizer motion detector. 5,025,378, Cl. 364-424.060.

Kaji, Hiroo: *See*—
Katsura, Toru; Kaji, Hiroo; Hyodo, Kenji; and Ohkura, Hirokazu, 5,024,986, Cl. 503-200.000.

Kajimoto, Chikara: *See*—
Omata, Tetsuo; Senda, Shuji; Tanaka, Tamaki; Kumagai, Eriko; Kajimoto, Chikara; and Nakazono, Yutaka, 5,024,832, Cl. 424-84.000.

Kaken Pharmaceutical Co., Ltd.: *See*—
Nagato, Shoin; Taguchi, Ryusuke; Hirai, Kenji; Hirose, Hiroaki; and Yokota, Masahiro, 5,024,692, Cl. 71-86.000.

Kakiuchi, Shinichi: *See*—
Yamagishi, Hisashi; Kakiuchi, Shinichi; and Tomita, Seisuke, 5,024,444, Cl. 273-232.000.

Kalos, Matthew J.: *See*—
Casper, Daniel F.; Flanagan, John R.; Gregg, Thomas A.; Huang, Catherine C.; and Kalos, Matthew J., 5,025,458, Cl. 375-114.000.

Kaltenbronn, James S.: *See*—
Doherty, Annette M.; Hudspeth, James P.; Kaltenbronn, James S.; Repine, Joseph T.; Roark, William H.; Sircar, Ila; and Tinney, Francis J., 5,024,994, Cl. 514-18.000.

Kamata, Hiroshi: *See*—
Kishiro, Osamu; Kamata, Hiroshi; and Sakai, Hideko, 5,025,082, Cl. 528-190.000.

Kameli, Nader, to Otis Elevator Company. Elevator traffic "filter" separating out significant traffic density data. 5,024,296, Cl. 187-132.000.

Kameyama, Takuma, to Sanshin Kogyo Kabushiki Kaisha. Oil supply device for two cycle engine. 5,024,190, Cl. 123-196.00R.

Kami, Hironori: *See*—
Arakawa, Masao; Terasawa, Tomizo; Ogawa, Masanobu; and Kami, Hironori, 5,025,169, Cl. 250-574.000.

Kamigaki, Masaharu; Oshikata, Hironobu; Kawata, Yoshihiro; Shiga, Nobuyasu; Omori, Hideharu; Kawashima, Masayuki; and Shimatani, Toshimichi, to Iwatsu Electric Company, Ltd. Key telephone system. 5,025,441, Cl. 370-77.000.

Kamimura, Kenji; and Tauzuki, Sadachika, to Honda Giken Kogyo Kabushiki Kaisha. Position detector for moving vehicle. 5,025,377, Cl. 364-424.020.

Kaminsky, Mark P.; Kleefisch, Mark S.; Huff, George A.; Washecheck, Don M.; Alvarado-Swaisgood, Aileen E.; and Barr, Mark K., to Amoco Corporation. Catalysts for the oxidative conversion of methane to higher hydrocarbons. 5,024,984, Cl. 502-303.000.

Kamman, Zora R. Swing rocker apparatus and furniture using same. 5,024,483, Cl. 297-272.000.

Kampe, Wolfgang: *See*—
Reinholz, Erhard; Friebe, Walter-Gunar; Kampe, Wolfgang; Mertin, Jurgen; and Wilhelms, Otto-Henning, 5,025,028, Cl. 514-381.000.

Kanai, Masahiro; Aoike, Tatsuyuki; Matsuda, Koichi; and Kawakami, Soichiro, to Canon Kabushiki Kaisha. Pin heterojunction photovoltaic elements with polycrystal AlP(H,F) semiconductor film. 5,024,706, Cl. 136-258.000.

Kanamaru, Kuniaki: *See*—
Suganuma, Katsuaki; Fujii, Hiroyuki; Minakuchi, Hiroyoshi; Kada, Katsuhiko; Osafune, Haruo; and Kanamaru, Kuniaki, 5,024,902, Cl. 428-633.000.

Kanegafuchi Chemical Industry Co., Ltd.: *See*—
Murakami, Satoru; Yamaguchi, Minori; Hayashi, Akimine; Kondo, Masataka; and Tawada, Yoshihisa, 5,025,297, Cl. 357-30.000.

Kaneko, Katsuhiko; and Nishida, Minoru, to Nishimatsu Co., Ltd.; and Tokin Corporation. Stonework crusher. 5,024,388, Cl. 241-301.000.

Kaneko, Yutaka: *See*—
Kita, Hiroshi; Wada, Hajime; and Kaneko, Yutaka, 5,024,930, Cl. 430-558.000.

Kanno, Tatsuya: *See*—
Ueda, Mitsuru; Kanno, Tatsuya; Iguchi, Yoshihiro; and Oshino, Yasuhiro, 5,025,083, Cl. 528-199.000.

Kanno, Tetsuo; Kotake, Yasushi; and Inada, Hitoshi, to Ricoh Company, Ltd. Disk drive apparatus with oil damper on eject lever. 5,025,339, Cl. 360-99.060.

Kanoe, Yasuo: *See*—
Tsukada, Shuya; Mochinaga, Nobuyuki; and Kanoe, Yasuo, 5,024,541, Cl. 400-88.000.

Kanouse, Richard C.: *See*—
Pierce, Kirby L.; and Kanouse, Richard C., 5,024,028, Cl. 51-432.000.

Kansai Paint Co., Ltd.: *See*—
Yabuta, Motoshi; Nakao, Yasushi; Sugiura, Shinji; Fukuda, Mitsuhiro; and Miyamoto, Yuzo, 5,025,060, Cl. 524-533.000.

Kao Corporation: *See*—
Deguchi, Katsuhiko; Saito, Kozo; Saijo, Hiroyuki; and Tosaka, Masaki, 5,025,069, Cl. 252-174.170.
Moriyama, Noboru; Ogura, Tsugitoshi; and Hiraki, Akio, 5,024,676, Cl. 44-301.000.
Tanaka, Nobuhiro; Hirata, Eiji; Moriguchi, Hideyuki; Azekura, Ko; Tsubone, Akira; and Ryu, Yasunori, 5,024,572, Cl. 414-276.000.

Kaplan, Steve E., to Multilink, Inc. Cable stripping device. 5,023,995, Cl. 30-90.100.

Karanewsky, Donald S., to E. R. Squibb & Sons, Inc. Phosphorus-containing HMG-CoA reductase inhibitor compounds. 5,025,000, Cl. 514-80.000.

Karanewsky, Donald S., to E. R. Squibb & Sons, Inc. Seco-mevinic acid derivatives useful as antihypercholesterolemic agents and new intermediates. 5,025,017, Cl. 514-277.000.

Karhumaki, Markku. Engagement profile or beam. 5,024,039, Cl. 52-735.000.

Karlsson, Lars-Ake, to Metsa-Serla OY. Tear-edge guard. 5,024,362, Cl. 225-20.000.

Karnas, Michael A.: *See*—
Grossman, David G.; Karnas, Michael A.; and Johnson, Ronald E., 5,024,790, Cl. 264-16.000.

Karnopp, Dean, to Robert Bosch GmbH. Apparatus for damping courses of motion. 5,024,302, Cl. 188-299.000.

Karpiel, John, to Wilson-Cook Medical, Inc. Sphincterotomy method and device having controlled bending and orientation. 5,024,617, Cl. 606-47.000.

Kasahara, Takeshi, to Toko, Inc. Variable-capacitance diode element having wide capacitance variation range. 5,024,955, Cl. 437-27.000.

Kasatani, Yasushi; and Tachikawa, Toru, to Mitsubishi Denki Kabushiki Kaisha. Connecting electrode. 5,024,605, Cl. 439-500.000.

Kashimura, Masashi: *See*—
Hanada, Kazuyuki; Kuroda, Kohichi; Misaizu, Iwao; Kashimura, Masashi; Goto, Tomoko; and Kuriyama, Katsumi, 5,024,893, Cl. 428-423.100.

Kaspar, Melvin: *See*—
Kostos, Jeffery; Kaspar, Melvin; and Artwohl, Paul, 5,024,023, Cl. 49-501.000.

Kastner, Arnold. Stapleless stapler. 5,024,643, Cl. 493-351.000.

Katagiri, Moriya: *See*—
Inoue, Takashi; Suzuki, Tatsuya; Kimura, Akiteru; Miyazaki, Hiroaki; and Katagiri, Moriya, 5,025,277, Cl. 354-173.100.

Kato, Kanami, to Signode Corporation. Binding strap operating apparatus. 5,024,149, Cl. 100-32.000.

Kato, Masahiko: *See*—
Nishii, Michiharu; Mizuno, Genji; Nomura, Yoshihisa; and Kato, Masahiko, 5,024,492, Cl. 303-114.000.
Kato, Mikihiko: *See*—
Endo, Yasushi; Kato, Mikihiko; Kawamata, Toshio; and Masaki, Kouichi, 5,024,885, Cl. 428-329.000.
Kato, Takahiro, to Pioneer Electronic Corporation. Automotive mileage calculating apparatus. 5,025,401, Cl. 364-561.000.
Katoh, Katsuaki: *See*—
Itoh, Takashi; and Katoh, Katsuaki, 5,024,905, Cl. 429-44.000.
Katraro, Reuven: *See*—
Linder, Charles; Perry, Mordechai; Nemas, Mara; and Katraro, Reuven, 5,024,765, Cl. 210-651.000.
Katsuaki, Muraishi, to Fuji Film Co., Ltd. Light scanning system for a stimulable sheet including vacuum and roller sheet holding means. 5,025,157, Cl. 250-327.200.
Katsura, Toru; Kaji, Hiroo; Hyodo, Kenji; and Ohkura, Hirokazu, to Mitsubishi Paper Mills Limited. Heat sensitive recording paper. 5,024,986, Cl. 503-200.000.
Katsuragi, Kohei, to Nihon Chikasui Kaihatsu Kabushiki Kaisha. Non-water-sprinkling type snow melting method and system. 5,024,553, Cl. 404-71.000.
Katsuyama, Koji: *See*—
Natori, Katsuhide; Watanabe, Isao; Katsuyama, Koji; Kawamura, Isao; Yamamoto, Karuhiko; and Nagai, Takeshi, 5,024,264, Cl. 165-1.000.
Katz, Leonoard R.: *See*—
Miller, Phillip E.; Katz, Leonoard R.; Nath, Raymond J.; Blaushild, Ronald M.; Tatch, Michael D.; Kordalski, Frank J.; Wykstra, Donald T.; and Kavalkovich, William M., 5,025,129, Cl. 219-201.000.
Kaufman, Jerry M., to Hemedix International, Inc. Composite catheter assembly. 5,024,665, Cl. 604-179.000.
Kavalkovich, William M.: *See*—
Miller, Phillip E.; Katz, Leonoard R.; Nath, Raymond J.; Blaushild, Ronald M.; Tatch, Michael D.; Kordalski, Frank J.; Wykstra, Donald T.; and Kavalkovich, William M., 5,025,129, Cl. 219-201.000.
Kavanagh, Dean L.; and Simon, Robert H. M., to Monsanto Company. Laminate for a safety glazing. 5,024,895, Cl. 428-437.000.
Kawa, Hajimu M.: *See*—
Lagow, Richard J.; Bierschenk, Thomas R.; Juhlke, Timothy J.; and Kawa, Hajimu M., 5,025,093, Cl. 568-601.000.
Kawabata, Susumu; Yoshida, Kazunori; Kisanuki, Yoshikatsu; Suzuki, Hajime; and Shiraki, Masao, to Kabushiki Kaisha Toyota Chuo Kenkyusho; and Kabushiki Kaisha Toyoda Jidoshokki. System for controlling warp take up and let off rates. 5,024,253, Cl. 139-99.000.
Kawada, Hiroyuki, to Sugiyasu Industries Co., Ltd. Method for the synchronous operation of juxtaposed cylinder devices. 5,024,141, Cl. 91-171.000.
Kawaguchi, Masaaki; Okamuro, Tomio; and Shirose, Keiichi, to Honda Giken Kogyo Kabushiki Kaisha. Vibration suppression apparatus for steering wheel with air bag. 5,024,464, Cl. 280-731.000.
Kawajiri, Kazuhiro: *See*—
Mutoh, Hideki; Oda, Kazuya; and Kawajiri, Kazuhiro, 5,025,319, Cl. 358-213.290.
Kawakami, Fukushi: *See*—
Shimizu, Yasushi; and Kawakami, Fukushi, 5,025,472, Cl. 381-63.000.
Kawakami, Katsura: *See*—
Gurd, John R.; and Kawakami, Katsura, 5,025,367, Cl. 364-200.000.
Kawakami, Shin; Nikaido, Katsutomo; and Ichikawa, Junichi, to Nippon CMK Corp. Printed wiring board having electromagnetic wave shielding layer. 5,025,116, Cl. 174-250.000.
Kawakami, Soichiro: *See*—
Kanai, Masahiro; Aoike, Tatsuyuki; Matsuda, Koichi; and Kawakami, Soichiro, 5,024,706, Cl. 136-258.000.
Kawamata, Toshio: *See*—
Endo, Yasushi; Kato, Mikihiko; Kawamata, Toshio; and Masaki, Kouichi, 5,024,885, Cl. 428-329.000.
Kawamura, Hideo, to Isuzu Motors Limited. Exhaust-driven electric generator system for internal combustion engines. 5,024,057, Cl. 60-597.000.
Kawamura, Isao: *See*—
Natori, Katsuhide; Watanabe, Isao; Katsuyama, Koji; Kawamura, Isao; Yamamoto, Karuhiko; and Nagai, Takeshi, 5,024,264, Cl. 165-1.000.
Kawamura, Masahiro: *See*—
Yoshiga, Norio; Kawamura, Masahiro; and Nonoyama, Hiroshi, 5,024,891, Cl. 428-414.000.
Kawanishi, Masaki: *See*—
Kokubo, Kouichi; Hamada, Toshiaki; Tagawa, Shinichi; Suzumura, Nobuyasu; Buma, Shuuichi; Aburaya, Toshio; Onuma, Toshio; Sato, Kunihito; Yonekawa, Takashi; Kawanishi, Masaki; Ikemoto, Hiroyuki; and Ohashi, Kaoru, 5,024,459, Cl. 280-707.000.
Kawashima, Masayuki: *See*—
Kamigaki, Masaharu; Oshikata, Hironobu; Kawata, Yoshihiro; Shiga, Nobuyasu; Omori, Hideharu; Kawashima, Masayuki; and Shimatani, Toshimichi, 5,025,441, Cl. 370-77.000.
Kawasuji, Keiji: *See*—
Sone, Toshiyuki; Matsumoto, Takehiko; Omotezako, Nobuya; and Kawasuji, Keiji, 5,025,338, Cl. 360-99.060.
Kawata, Yoshihiro: *See*—
Kamigaki, Masaharu; Oshikata, Hironobu; Kawata, Yoshihiro; Shiga, Nobuyasu; Omori, Hideharu; Kawashima, Masayuki; and Shimatani, Toshimichi, 5,025,441, Cl. 370-77.000.
Kawazoe, Hiromitsu: *See*—
Nagano, Susumu; Kawazoe, Hiromitsu; and Ohsawa, Katsuyuki, 5,024,184, Cl. 123-48.00R.
Kazmark, Eugene A.; and Kazmark, Eugene A., Jr. Portable luggage carrier with pivotable wheels. 5,024,458, Cl. 280-645.000.
Kazmark, Eugene A., Jr.: *See*—
Kazmark, Eugene A.; and Kazmark, Eugene A., Jr., 5,024,458, Cl. 280-645.000.
Keeler, Preston J., III: *See*—
Vasconcellos, Alfred V.; and Keeler, Preston J., III, 5,024,613, Cl. 604-4.000.
Keen, Billy J., Jr.: *See*—
Garthaffner, Martin T.; Keen, Billy J., Jr.; Gillespie, Andrew J.; Wheless, Jack C.; and Dingus, George W., 5,024,242, Cl. 131-94.000.
Keenan, W. Russ: *See*—
Mydill, Marc R.; Pile, Sam R.; O'Keefe, Sheila; Okerblom, Neal F.; and Keenan, W. Russ, 5,025,205, Cl. 324-73.100.
Kelch, Thomas: *See*—
Meinherz, Manfred; Veuhoff, Freidrich-Wilh; Gilmozzi, Gunther; and Kelch, Thomas, 5,025,118, Cl. 200-148.00R.
Kelman, David C.: *See*—
Smith, Todd S.; and Kelman, David C., 5,024,670, Cl. 623-18.000.
Kemper, John J., to Kemper, John Joseph. Easily removable oil filter. 5,024,760, Cl. 210-232.000.
Kemper, John Joseph: *See*—
Kemper, John J., 5,024,760, Cl. 210-232.000.
Kempers, Torben P.: *See*—
Hamersma, Wilhelmus J. L. A.; Kempers, Torben P.; and Roovers, Wilhemus M. M., 5,025,055, Cl. 524-269.000.
Kendall Company, The: *See*—
Ovassapian, Andranik; and Dye, John F., 5,024,218, Cl. 128-200.260.
Kenmotsu, Isami: *See*—
Funabashi, Tadashi; and Kenmotsu, Isami, 5,025,440, Cl. 369-199.000.
Kennametal Inc.: *See*—
Mehrotra, Pankaj K.; and Billman, Elizabeth R., 5,024,976, Cl. 501-89.000.
Kennedy, Christopher R.; and Newkirk, Marc S., to Lanxide Technology Company, LP. Method of making shaped ceramic composites. 5,024,795, Cl. 264-59.000.
Kennedy, David L.; True, Donald C.; and Welsh, David M., to Imperial Chemical Industries PLC. Multi-directional initiator for explosives. 5,024,158, Cl. 102-275.110.
Kenney, George B.: *See*—
Ashdown, Charles P.; Bewley, James G.; and Kenney, George B., 5,024,695, Cl. 75-338.000.
Kenney, M. Cristina: *See*—
Nesburn, Anthony B.; Gorin, Michael; Martinez, Marvin; Kenney, M. Cristina; and Maguen, Ezra, 5,024,742, Cl. 204-157.680.
Kerrey, John S.: *See*—
Cioffi, Joseph V.; and Kerrey, John S., 5,024,806, Cl. 376-352.000.
Kersting, Hermann: *See*—
Harig, Horst; and Kersting, Hermann, 5,024,630, Cl. 460-21.000.
Kessler, David: *See*—
Parulski, Kenneth A.; and Kessler, David, 5,025,313, Cl. 358-54.000.
Kessler, Lawrence: *See*—
Fantozzi, Louis R.; Kessler, Lawrence; and Draxler, Richard, 5,024,493, Cl. 350-1.300.
Ketcham, Raymond H. Device for hanging outdoor Christmas lights. 5,024,406, Cl. 248-149.000.
Kettenbauer, Franz. Process and device suitable for thermally processing a material comprising thermally degradable and thermally-resistant substances. 5,024,598, Cl. 432-59.000.
Keturakis, Andrius A.: *See*—
Germer, Warren R.; Coryea, Peter F.; Keturakis, Andrius A.; Masury, David H.; and Stevens, Thomas H., 5,025,206, Cl. 324-74.000.
Keyser, George T., Jr.; Fosler, Carl R.; and Johnson, Jeffrey D., to JML Communications, Inc. Portable personal-banking system. 5,025,373, Cl. 364-408.000.
Khalifa, Mustafa A.; and Chapp, James, Jr., to Chrysler Corporation. Steering column guide structure. 5,024,118, Cl. 74-492.000.
Khorramian, Behrooz A.: *See*—
Hardin, Tommy G.; and Khorramian, Behrooz A., 5,024,506, Cl. 350-96.230.
Kidd, ALexander D., to Carroll, Noel, a part interest. Gyroscopic apparatus. 5,024,112, Cl. 74-5.370.
Kihara, Hiroyuki; and Omori, Hideki, to Seiko Seiki Kabushiki Kaisha. Control system of grinding machine. 5,024,025, Cl. 51-165.770.
Kikuchi, Reiji: *See*—
Isukimi, Hayatsugu; and Kikuchi, Reiji, 5,024,482, Cl. 296-194.000.
Kikuchi, Toshihiro: *See*—
Neishi, Toshie; Kikuchi, Toshihiro; Takiguchi, Takao; Suzuki, Koichi; and Matsumoto, Masakazu, 5,024,912, Cl. 430-59.000.
Kikuchi, Toshiyuki: *See*—
Seki, Nobuyoshi; Morii, Nobuyuki; Sugiyama, Yoshihide; Komada, Takashi; Hosoi, Masatoshi; Hujiwara, Atuhisa; Ichinose, Tsutomu; Mori, Goro; Kikuchi, Toshiyuki; and Minato, Masahiro, 5,024,430, Cl. 270-53.000.

Kim, Henry I. Desoldering vat. 5,024,366, Cl. 228-56.100.
Kim, Heung S.; and Myung, Chan K., to SamSung Semiconductor and Telecommunication Co. Ltd. TTL to ECL voltage level translator. 5,025,180, Cl. 307-475.000.
Kimberly-Clark Corporation: *See*—
Soerens, Dave A., 5,025,046, Cl. 524-72.000.
Kimura, Akiteru: *See*—
Inoue, Takashi; Suzuki, Tatsuya; Kimura, Akiteru; Miyazaki, Hiroaki; and Katagiri, Moriya, 5,025,277, Cl. 354-173.100.
Kimura, Masatoshi, to Mitsubishi Denki Kabushiki Kaisha. Portable semiconductor memory device. 5,025,420, Cl. 365-230.010.
Kimura, Youichi: *See*—
Tanaka, Tsuneo; Sato, Kazue; Takewa, Hiroyuki; Kurozuka, Akira; Tamura, Tadashi; Hattori, Katsuji; Takayama, Satoshi; Murata, Kosaku; Satoh, Katsuaki; Serikawa, Mituhiko; Kimura, Youichi; and Obata, Shuichi, 5,025,474, Cl. 381-90.000.
King, Stephen W., to Union Carbide Chemicals and Plastics Technology Corporation. Heterogeneous alkoxylation using anion-bound metal oxides. 5,025,094, Cl. 568-623.000.
Kino, Hirotoshi: *See*—
Kubota, Jun; Kino, Hirotoshi; Musha, Yosinori; and Okada, Hisao, 5,024,094, Cl. 73-634.000.
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Kinoshita, Jiro: *See*—
Kurakake, Mitsuo; and Kinoshita, Jiro, 5,025,200, Cl. 318-569.000.
Kinoshita, Yoshimi: *See*—
Kobayashi, Toshiyuki; Koshinaka, Masao; Kinoshita, Yoshimi; Oda, Masao; and Yoshizawa, Kenji, 5,024,182, Cl. 118-723.000.
Kinoshita, Yoshio; and Nawa, Mitsuharu, to NSK Warner K.K. One-way clutch and holder for torque transmitting members thereof. 5,024,308, Cl. 192-41.00A.
Kinze Manufacturing, Inc.: *See*—
Deckler, Harry C., 5,024,173, Cl. 111-178.000.
Kirahara, Masaki: *See*—
Fujikawa, Yoshihiro; Suzuki, Mikio; Iwasaki, Hiroshi; Sakashita, Mitsuaki; and Kirahara, Masaki, 5,024,999, Cl. 514-63.000.
Kirikami, Seiichi: *See*—
Sato, Isao; Kirikami, Seiichi; Shimura, Akira; Hirose, Fumiyuki; Inose, Hiroshi; Urushidani, Haruo; and Arai, Osamu, 5,024,055, Cl. 60-39.270.
Kiriseko, Tadashi; Tani, Hiromichi; Soma, Noriko; Shigemi, Nobuhisa; and Toyoda, Takayuki, to Fujitsu Limited. Continuous semiconductor substrate processing system. 5,024,570, Cl. 414-222.000.
Kirkman, Kenneth G. Apparatus and method for collecting shellfish and the like. 5,024,009, Cl. 37-55.000.
Kirsch, Donald R.: *See*—
Aklonis, Carol A.; Ax, Helen A.; Kirsch, Donald R.; O'Sullivan, Joseph; Tymiak, Adrienne; and Wells, J. Scott, 5,024,839, Cl. 424-115.000.
Kisanuki, Yoshikatsu: *See*—
Kawabata, Susumu; Yoshida, Kazunori; Kisanuki, Yoshikatsu; Suzuki, Hajime; and Shiraki, Masao, 5,024,253, Cl. 139-99.000.
Kishiro, Osamu; Kamata, Hiroshi; and Sakai, Hideko, to Mitsubishi Kasei Corporation. Aromatic polyester, aromatic polyester-amide and processes for producing the same. 5,025,082, Cl. 528-190.000.
Kita, Hiroshi; Wada, Hajime; and Kaneko, Yutaka, to Konica Corporation. Silver halide photographic light-sensitive material containing a Novel photographic coupler. 5,024,930, Cl. 430-558.000.
Kitagawa, Isao. Bulk material feeder provided with internal cleaning mechanism. 5,024,561, Cl. 406-173.000.
Kitamura, Shigeharu; Nakamura, Haruhiko; and Sanada, Masaru, to Mitsubishi Denki Kabushiki Kaisha. Escalator system with convertible steps for wheel chair. 5,024,314, Cl. 198-333.000.
Kitano, Hirohisa: *See*—
Matsubara, Ken; Saito, Itaru; Kitano, Hirohisa; Shingaki, Kouichi; and Masuda, Tomohiko, 5,024,511, Cl. 350-356.000.
Kitazawa, Toshiyuki; Kurosaki, Masahiko; and Ohsawa, Yutaka, to Asahi Kogaku Kogyo Kabushiki Kaisha. Control apparatus of single-lens reflex camera. 5,025,276, Cl. 354-152.000.
Kiyama, Seiichi: *See*—
Hirono, Yutaka; Kiyama, Seiichi; and Osumi, Masato, 5,024,724, Cl. 156-643.000.
Kiyosawa, Junichi, to Asics Corporation. Athletic shoe. 5,024,006, Cl. 36-83.000.
Kladden, Gregory S.: *See*—
Hawley, Erwin T.; and Kladden, Gregory S., 5,024,450, Cl. 277-37.000.
Klank, Otto; and Rottmann, Dieter, to Deutsche Thomson-Braudt GmbH. Adaptive digital filter for multi path distortion cancellation. 5,025,406, Cl. 364-724.190.
Kleefisch, Mark S.: *See*—
Kaminsky, Mark P.; Kleefisch, Mark S.; Huff, George A.; Washecheck, Don M.; Alvarado-Swaisgood, Aileen E.; and Barr, Mark K., 5,024,984, Cl. 502-303.000.
Kleinewefers GmbH: *See*—
Hannen, Jakob, 5,024,718, Cl. 156-475.000.
Kleingraeber, Karl-Josef: *See*—
Heidjann, Franz; and Kleingraeber, Karl-Josef, 5,024,631, Cl. 460-75.000.
Kleinschmidt, Peter; and Mader, Gerhard, to Siemens Aktiengesellschaft. Optical sensor line of amorphous or polycrystalline photoelectric material having a plurality of sensor elements. 5,025,146, Cl. 250-214.00L.
Kley, Uwe: *See*—
Booten, Sigmund; Kley, Uwe; and Hoffmann, Cristiano, 5,024,304, Cl. 188-356.000.
Kline, Joseph M. Periodontal scaler-like medicinal fluid applicator. 5,024,600, Cl. 433-82.000.
Klingen, Jurgen: *See*—
Veasley, George F.; Klingen, Jurgen; and Landin, Donald T., 5,024,880, Cl. 428-317.500.
Klock, Jurgen; Fischer, Gerhard; and Grubisic, Vatroslav, to Fraunhofer-Gesellschaft. Device for testing trailer couplings under loading conditions resembling those occurring in use, preferably with inclusion of the construction for fixing the trailer coupling. 5,024,102, Cl. 73-798.000.
Klotsvog, Grigory N.: *See*—
Popov, Nikolai P.; Plotnikov, Andrei D.; and Klotsvog, Grigory N., 5,024,124, Cl. 74-625.000.
Klug, Gunter; Jabs, Gert; Berneth, Horst; and Botta, Artur, to Bayer Aktiengesellschaft. Recording material. 5,024,987, Cl. 503-211.000.
Klughart, Kevin M., to Dallas Semiconductor Corporation. Wireless communication system with parallel polling. 5,025,486, Cl. 455-54.000.
Kniarmco Inc.: *See*—
Knight, C. Reed, Jr.; and Stoner, Eugene M., 5,024,139, Cl. 89-154.000.
Knifton, John F.: *See*—
Sanderson, John R.; Marquis, Edward T.; and Knifton, John F., 5,025,112, Cl. 585-852.000.
Sanderson, John R.; and Knifton, John F., 5,025,113, Cl. 568-909.800.
Knight, C. Reed, Jr.; and Stoner, Eugene M., to Kniarmco Inc. Firearm with movable barrel safety. 5,024,139, Cl. 89-154.000.
Knoll International, Inc.: *See*—
Morrison, Andrew I., 5,024,030, Cl. 52-36.000.
Kobayashi, Akira: *See*—
Ohshima, Masaaki; Kobayashi, Akira; Atsumi, Senji; and Shimada, Hiromi, 5,024,907, Cl. 429-191.000.
Kobayashi, Kazumitsu; and Sunou, Hiroki, to Japan Electronic Control Systems Co., Ltd. Assist air supply system for internal combustion engine. 5,024,201, Cl. 123-531.000.
Kobayashi, Manabu: *See*—
Okui, Kaoru; and Kobayashi, Manabu, 5,024,287, Cl. 180-297.000.
Kobayashi, Toshiyuki; Koshinaka, Masao; Kinoshita, Yoshimi; Oda, Masao; and Yoshizawa, Kenji, to Mitsubishi Denki Kabushiki Kaisha. Thin film forming apparatus having a gas flow settling device. 5,024,182, Cl. 118-723.000.
Koberstein, Edgar; Engler, Bernd; Domesle, Rainer; and Schubert, Peter, to Degussa Aktiengesellschaft. Support material for three-way catalysts containing platinum group metal and having reduced tendency for H_2S emission. 5,024,985, Cl. 502-304.000.
Kobs, Rolf U. D.: *See*—
Graeger, Volker; and Kobs, Rolf U. D., 5,024,097, Cl. 73-727.000.
Koch Materials Company: *See*—
Benneyworth, Douglas F.; and Baker, Richard J., 5,024,554, Cl. 404-74.000.
Kodama, Yoshimi: *See*—
Tsuchida, Takefumi; Yoshida, Minoru; Kodama, Yoshimi; and Moriyama, Masahiro, 5,025,332, Cl. 360-85.000.
Kodera, Kaoru: *See*—
Iiyama, Kiyotaka; Hayakawa, Kunio; Nakata, Masahiro; Kodera, Kaoru; and Miyazaki, Osamu, 5,024,699, Cl. 106-21.000.
Koegel, Robert J.; and Rabins, Leonard. Circuit for preventing lock-out of high priority requests to a system controller. 5,025,370, Cl. 364-200.000.
Koguchi, Tatsushi; Ito, Shigehiro; Ebihara, Kazyuki; and Nishi, Yuji, to Victor Company of Japan, Ltd. Ghost canceler using reference signals to generate updated criterion functions on which tap gains are determined. 5,025,317, Cl. 358-167.000.
Kohnke, Ole B., to Testa-Laboratorium A/S. Aspirator. 5,024,653, Cl. 604-35.000.
Kojima, Aiki: *See*—
Kondo, Hitoshi; Suwabe, Hiroyuki; and Kojima, Aiki, 5,025,230, Cl. 331-116.0FE.
Kokubo, Kouichi; Hamada, Toshiaki; Tagawa, Shinichi; Suzumura, Nobuyasu; Buma, Shuuichi; Aburaya, Toshio; Onuma, Toshio; Sato, Kunihito; Yonekawa, Takashi; Kawanishi, Masaki; Ikemoto, Hiroyuki; and Ohashi, Kaoru, to Toyota Jidosha Kabushiki Kaisha; and Aisin Seiki Kabushiki Kaisha. Pressure control system for suspension. 5,024,459, Cl. 280-707.000.
Kolb, Roland: *See*—
Jetzer, Gregor; Kolb, Roland; and Spinnler, Fritz, 5,024,589, Cl. 418-55.300.
Kolbenschmidt Aktiengesellschaft: *See*—
Matucha, Karl-Heinz; Steffens, Thomas; Baureis, Hans-Paul; Bickle, Wolfgang; and Braus, Jurgen, 5,024,881, Cl. 428-323.000.
Matucha, Karl-Heinz; Steffens, Thomas; Baureis, Hans-Paul; Bickle, Wolfgang; and Braus, Jurgen, 5,024,882, Cl. 428-323.000.
Kolp, Robert J., Jr.: *See*—
Lee, Leighton, II; and Kolp, Robert J., Jr., 5,023,990, Cl. 29-525.100.
Komada, Takashi: *See*—
Seki, Nobuyoshi; Morii, Nobuyuki; Sugiyama, Yoshihide; Komada, Takashi; Hosoi, Masatoshi; Hujiwara, Atuhisa; Ichinose, Tsutomu; Mori, Goro; Kikuchi, Toshiyuki; and Minato, Masahiro, 5,024,430, Cl. 270-53.000.
Komaki, Toshihiro; Kudo, Hideo; Ishizuki, Tomonori; and Yokozeki, Shinichi, to Pioneer Electronic Corporation. Method for recording

and reproducing of information on an optical disk of a phase-change type. 5,025,439, Cl. 369-100.000.

Komatsu Dresser Company: *See*—
Deli, Jack M., 5,024,283, Cl. 180-89.140.

Komatsu, Fumito; Usuki, Hideo; and Oguchi, Yuzo, to K.K. Sankto Seiki Seisakusho. Electromagnetic accelerometer. 5,024,088, Cl. 73-517.00B.

Komori Printing Machinery Co., Ltd.: *See*—
Ito, Kiyoshi, 5,024,154, Cl. 101-148.000.

Komoriya, Susumu; Nishizuka, Hiroshi; Nakagawa, Shinya; and Maejima, Hisashi, to Hitachi, Ltd. Exposure method and exposure apparatus. 5,025,284, Cl. 355-53.000.

Komyoji, Hirosuke: *See*—
Masuyama, Masaru; Takemae, Yoshihiro; Endoh, Tetsuhiko; Komyoji, Hirosuke; Tanaka, Ryuji; and Itakura, Katsuhiko, 5,025,415, Cl. 365-52.000.

Kondo, Hitoshi; Suwabe, Hiroyuki; and Kojima, Aiki, to Kabushiki Kaisha Toshiba. Oscillator circuit incorporated in a semiconductor circuit. 5,025,230, Cl. 331-116.0FE.

Kondo, Kazuo; and Okuyama, Masahiko, to NGK Spark Plug Co., Ltd. Crystallized glass tooth crown material. 5,024,973, Cl. 501-10.000.

Kondo, Masataka: *See*—
Murakami, Satoru; Yamaguchi, Minori; Hayashi, Akimine; Kondo, Masataka; and Tawada, Yoshihisa, 5,025,297, Cl. 357-30.000.

Kondo, Takeshi: *See*—
Yamada, Ichiji; Inuzuka, Yutaka; Murakami, Michiyuki; Suzuki, George; Tanahashi, Tyo; and Kondo, Takeshi, 5,024,117, Cl. 74-473.00P.

Kondo, Yoshio. Compact having an illuminator. 5,025,354, Cl. 362-135.000.

Kondou, Yasuhiro: *See*—
Nakano, Shigeru; and Kondou, Yasuhiro, 5,024,284, Cl. 180-179.000.

Konica Corporation: *See*—
Haneda, Satoshi; and Nomori, Hiroyuki, 5,025,272, Cl. 346-153.100.
Kita, Hiroshi; Wada, Hajime; and Kaneko, Yutaka, 5,024,930, Cl. 430-558.000.
Kurihara, Etsuzou, 5,024,509, Cl. 350-254.000.
Shoji, Hisashi; Tamura, Akihiko; Itaya, Masahiko; Fuma, Hiroshi; and Soma, Shinobu, 5,024,181, Cl. 118-658.000.
Tanji, Masaki; and Nishijima, Toyoki, 5,024,932, Cl. 430-567.000.

Konishi, Masataka; Tomita, Koji; Oka, Masahisa; and Numata, Kenichi, to Bristol-Myers Company. Peptide antibiotics. 5,025,023, Cl. 514-183.000.

Konrad Doppelmayr & Sohn Maschinenfabrik Gesellschaft m.b.H. & Co. KG: *See*—
Nigg, Ernst; and Fuchs, Elmar B., 5,024,162, Cl. 104-178.000.

Konrad, Gerd: *See*—
Crema, Stefano C.; Kucera, Clare H.; Konrad, Gerd; and Hartmann, Heinrich, 5,025,040, Cl. 523-130.000.

Kopf, Rose F.; Kuo, J. M.; Luftman, Henry S.; and Schubert, Erdmann F., to AT&T Bell Laboratories. Doping procedures for semiconductor devices. 5,024,967, Cl. 437-95.000.

Koponen, Jari: *See*—
Ritala, Risto; Laakso, Mikko; and Koponen, Jari, 5,025,154, Cl. 250-308.000.

Kopp, Clinton V.: *See*—
Ford, Douglas L.; Anderson, Eric W.; and Kopp, Clinton V., 5,024,762, Cl. 210-321.690.
Needham, Thomas E.; Wright, Jeremy C.; Pearson, Steve; Chilamkurti, Rao; and Kopp, Clinton V., 5,024,657, Cl. 604-85.000.

Kopp, Richard: *See*—
Neuhaus, Alfred; Ganster, Otto; and Kopp, Richard, 5,025,039, Cl. 521-51.000.

Korb, William B., to American Saw & Mfg. Company. Segmental grinding wheel. 5,024,026, Cl. 51-206.400.

Kordalski, Frank J.: *See*—
Miller, Phillip E.; Katz, Leonoard R.; Nath, Raymond J.; Blaushild, Ronald M.; Tatch, Michael D.; Kordalski, Frank J.; Wykstra, Donald T.; and Kavalkovich, William M., 5,025,129, Cl. 219-201.000.

Koshiba, Yutaka: *See*—
Futatasuka, Rensei; Koshiba, Yutaka; Chiba, Shunich; Orikasa, Toyoaki; Noguchi, Seiji; and Idoshita, Takuya, 5,024,814, Cl. 420-473.000.

Koshiishi, Osamu: *See*—
Mitsuishi, Akio; Takeuchi, Takashi; and Koshiishi, Osamu, 5,024,543, Cl. 400-124.000.

Koshinaka, Masao: *See*—
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Bellows, James C.; and Koubek, Rudolph, III, 5,024,582, Cl. 416-213.00R.

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Akiyama, Koichi, 5,024,520, Cl. 351-221.000.

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Lamb, William E.; Kowaleski, Jerome L.; Haikl, Vojtech; Bittancourt, Alan R.; and Daugherty, Harvey S., 5,025,280, Cl. 354-299.000.

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Brenner, Michael B.; Strominger, Jack L.; Seidman, Jonathan; Ip, Stephen H.; and Krangel, Micahel S., 5,024,940, Cl. 435-69.100.

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Jorissen, Steven A.; Lundy, Charles E.; Krishnan, Sivaram; Mafoti, Robson; and Pyles, Robert A., 5,025,056, Cl. 524-310.000.

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Winter, Horst, 5,024,717, Cl. 156-354.000.

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Gorler, Klaus; Krumbiegel, Gunter; Hanack, Michael; and Subramanian, Lakshmina R., 5,024,743, Cl. 204-157.690.

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Patzelt, Norbert; and von Seebach, Michael, 5,024,754, Cl. 209-135.000.

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Chu, George H.; Ogawa, Yasushi; McPherson, John M.; Ksander, George; Pratt, Bruce; Hendricks, Diana; and McMullin, Hugh, 5,024,841, Cl. 424-422.000.

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Pfaffmann, George D.; Kubis, Charles S.; Currie, John P.; Balzer, Norbert R.; Walter, John; and Adams, Graham R., 5,025,123, Cl. 219-10.750.

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Kubodera, Kenichi: *See*—
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Sasaki, Souji; Kino, Hirotoshi; Musha, Yoshinori; Kubota, Jun; and Okada, Hisao, 5,024,093, Cl. 73-633.000.
Kubota, Ltd.: *See*—
Fukui, Tetsu; Yoshii, Takashi; Takemura, Toshihiko; and Hattori, Akio, 5,024,306, Cl. 192-3.570.
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Uchida, Hiroshi; and Kubota, Norio, 5,024,392, Cl. 242-128.000.
Kucera, Clare H.: *See*—
Crema, Stefano C.; Kucera, Clare H.; Konrad, Gerd; and Hartmann, Heinrich, 5,025,040, Cl. 523-130.000.
Kuczynski, Anthony L.; Ayer, Atul D.; and Wong, Patrick S.-L., to ALZA Corporation. Oral hypoglycemic glipizide granulation. 5,024,843, Cl. 424-499.000.
Kud, Alexander: *See*—
Oftring, Alfred; Birnbach, Stefan; Fikentscher, Rolf; Baur, Richard; Kud, Alexander; Goeckel, Ulrich; and Perner, Johannes, 5,025,103, Cl. 560-170.000.
Kudo, Hideo: *See*—
Komaki, Toshihiro; Kudo, Hideo; Ishizuki, Tomonori; and Yokozeki, Shinichi, 5,025,439, Cl. 369-100.000.
Kudo, Yoshinobu: *See*—
Taniguchi, Nobuyuki; Hata, Yoshiaki; Kudo, Yoshinobu; Inoue, Manabu; Hoda, Takeo; and Ueda, Hiroshi, 5,025,275, Cl. 354-106.000.
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Kuhn S.A.: *See*—
Aron, M. Jerome, 5,024,053, Cl. 56-367.000.
Kuhnemund, Bernd: *See*—
Gmur, Bruno; and Kuhnemund, Bernd, 5,024,352, Cl. 222-1.000.
Kuizenga, Dirk J., to Laserscope. Intra-cavity beam relay for optical harmonic generation. 5,025,446, Cl. 372-21.000.
Kukimoto, Tsutomu: *See*—
Sato, Yukou; and Kukimoto, Tsutomu, 5,024,915, Cl. 430-110.000.
Kumagai, Eriko: *See*—
Omata, Tetsuo; Senda, Shuji; Tanaka, Tamaki; Kumagai, Eriko; Kajimoto, Chikara; and Nakazono, Yutaka, 5,024,832, Cl. 424-84.000.
Kumar, Surinder: *See*—
Sohner, Harold K.; Hoyloak, Joel N.; Girvin, Richard J.; and Kumar, Surinder, 5,025,452, Cl. 375-1.000.
Kun, Zoltan K.: *See*—
Leksell, David; Kun, Zoltan K.; and Asars, Juris A., 5,025,321, Cl. 358-296.000.
Kunimune, Kouichi: *See*—
Maeda, Hirotoshi; and Kunimune, Kouichi, 5,025,088, Cl. 528-353.000.
Kunz, Barbara L.: *See*—
Craun, Gary P.; and Kunz, Barbara L., 5,025,063, Cl. 524-560.000.
Kuo, J. M.: *See*—
Kopf, Rose F.; Kuo, J. M.; Luftman, Henry S.; and Schubert, Erdmann F., 5,024,967, Cl. 437-95.000.
Kurakake, Mitsuo; and Kinoshita, Jiro, to Fanuc Ltd. Synchronous control system. 5,025,200, Cl. 318-569.000.
Kurihara, Etsuzou, to Konica Corporation. Structural combination of plastic lenses. 5,024,509, Cl. 350-254.000.
Kurihara, Kazumasa; and Takahashi, Tsutomu, to Zexel Corporation. Method for controlling vehicle transmission systems. 5,024,305, Cl. 192-0.055.
Kurisaki, Hideo; and Nishikawa, Masahiko, to Chisso Corporation. Powdery cosmetic containing cellulose powder impregnated with moisturizing polymer. 5,024,831, Cl. 424-69.000.
Kurita, Toshiyuki: *See*—
Sekiya, Hiroshi; Kurita, Toshiyuki; Nakagaki, Nobufumi; and Murata, Toshinori, 5,025,310, Cl. 358-19.000.
Kuriyama, Katsumi: *See*—
Hanada, Kazuyuki; Kuroda, Kohichi; Misaizu, Iwao; Kashimura, Masashi; Goto, Tomoko; and Kuriyama, Katsumi, 5,024,893, Cl. 428-423.100.
Kuriyama, Yuji, to Casio Computer Co., Ltd. Electronic display device for displaying calendar information. 5,025,427, Cl. 368-29.000.
Kuroda, Kohichi: *See*—
Hanada, Kazuyuki; Kuroda, Kohichi; Misaizu, Iwao; Kashimura, Masashi; Goto, Tomoko; and Kuriyama, Katsumi, 5,024,893, Cl. 428-423.100.
Kurosaki, Masahiko: *See*—
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Kurozuka, Akira: *See*—
Tanaka, Tsuneo; Sato, Kazue; Takewa, Hiroyuki; Kurozuka, Akira; Tamura, Tadashi; Hattori, Katsuji; Takayama, Satoshi; Murata, Kosaku; Satoh, Katsuaki; Serikawa, Mituhiko; Kimura, Youichi; and Obata, Shuichi, 5,025,474, Cl. 381-90.000.
Kuruma, Kiyoshi; Abe, Masaki; Kagechika, Hiroshi; and Kagaya, Shinichi, to NKK Corporation. Composite nickel-phosphorus alloy plated metal sheet excellent in strippability and having high hardness and method for manufacturing same. 5,024,900, Cl. 428-626.000.
Kurze, Werner: *See*—
Clauss, Wolfgang; Kurze, Werner; Leifeld, Ferdinand; and Wassenberg, Willy, 5,024,736, Cl. 204-49.000.
Kuschewski, Gustav: *See*—
Fortmann, Robert C.; Pinnow, Curtis C.; Kuschewski, Gustav; and Joseph, William A., Jr., 5,025,132, Cl. 219-401.000.
Kusuda, Yasuhiro, to Minolta Camera Kabushiki Kaisha. Image forming apparatus capable of preventing simultaneous rotation of the magnet roll and the developing sleeve. 5,025,288, Cl. 355-251.000.
Kuwabara, Osamu: *See*—
Suzuki, Satoshi; Kuwabara, Osamu; Muto, Jiro; and Shinozaki, Eiichi, 5,025,348, Cl. 361-398.000.
Kwak, Yoon T.: *See*—
Helioff, Michael W.; Tazi, Mohammed; Kwak, Yoon T.; and Login, Robert B., 5,024,779, Cl. 252-162.000.
KWM-Kunststoffmaschinen GmbH: *See*—
Will, Manfred O., 5,024,531, Cl. 366-75.000.
Kyhl, Henry, to Buhl Industries, Inc. Video imaging podium. 5,025,320, Cl. 358-229.000.
Kysela, Ernst: *See*—
Lantzsch, Reinhard; Kysela, Ernst; Buchel, Karl H.; Dutzmann, Stefan; Brandes, Wilhelm; and Hanssler, Gerd, 5,025,030, Cl. 514-383.000.
La, Duong T.: *See*—
Baker, Jeffrey P.; La, Duong T.; and Coverstone, Randy A., 5,025,271, Cl. 346-140.00R.
La Mina Ltd.: *See*—
Guirguis, Raouf A., 5,024,237, Cl. 128-760.000.
Laakso, Mikko: *See*—
Ritala, Risto; Laakso, Mikko; and Koponen, Jari, 5,025,154, Cl. 250-308.000.
Labadie, Louis: *See*—
Doussiet, Roger; and Labadie, Louis, 5,024,110, Cl. 73-864.620.
Labuz, Joseph F.: *See*—
Vardoulakis, Ioannis; Labuz, Joseph F.; and Papamichos, Euripides, 5,024,103, Cl. 73-819.000.
La Croix, Mark E., to Torrington Company, The. Method and apparatus for forming magnetized zones on a magnetizable body. 5,025,240, Cl. 335-284.000.
Lagerstedt, Torgny: *See*—
Inge, Claes; Franzen, Peter; Lagerstedt, Torgny; Borgstrom, Leonard; Carlsson, Claes-Goran; Moberg, Hans; and Näbo, Olle, 5,024,648, Cl. 494-56.000.
Lagow, Richard J.; Bierschenk, Thomas R.; Juhlke, Timothy J.; and Kawa, Hajimu M., to Exfluor Research Corporation. Pyrolysis of perfluoropolyethers. 5,025,093, Cl. 568-601.000.
Lagowski, Jacek J. Method and apparatus for determining the minority carrier diffusion length from linear constant photon flux photovoltage measurements. 5,025,145, Cl. 250-211.00J.
Lagushenko Radomir: *See*—
Bouchard, Andre C.; Thibault, Paul A.; Lagushenko Radomir; Maya, Jakob; and Maya, Jakob, 5,025,190, Cl. 313-619.000.
Lailler, Jean L.: *See*—
Gloanec, Maurice; Jarry, Jacques; and Lailler, Jean L., 5,025,212, Cl. 324-158.00R.
Laine, Juhani; Nyman, Mikko; and Paananen, Tapio, to Ilmatera OY. Method and apparatus for the control of air flows and pressures in air-conditioning. 5,024,263, Cl. 165-1.000.
Laitram Corporation: *See*—
Lapeyre, James M., 5,024,321, Cl. 198-853.000.
Lamb, William E.; Kowaleski, Jerome L.; Haikl, Vojtech; Bittancourt, Alan R.; and Daugherty, Harvey S., to Texas Instruments Incorporated. Immersion development and rinse machine and process. 5,025,280, Cl. 354-299.000.
Lamond, Thomas W. Method for removing a bowling ball fingertip insert from a bowling ball finger hole. 5,023,988, Cl. 29-426.100.
Lamont, Lawrence T., Jr.: *See*—
Turner, Frederick T.; Hutchinson, Martin A.; Shaw, R. H.; and Lamont, Lawrence T., Jr., 5,024,747, Cl. 204-298.090.
Land, John T.; and Hopkins, Ronald J., to Westinghouse Electric Corp. Combined support column and guide tube for use in a nuclear reactor. 5,024,808, Cl. 376-353.000.
Landa, Benzion; Krumberg, Yakov; and Adam, Yossef, to Savin Corporation. Pulsed voltage development electrode cleaner. 5,025,290, Cl. 355-265.000.
Landers, Perry E.; and Felton, George F., to Ashland Oil, Inc. Coating composition and method for forming a self-heating corrosion preventative film. 5,024,697, Cl. 106-14.130.
Landin, Donald T.: *See*—
Veasley, George F.; Klingen, Jurgen; and Landin, Donald T., 5,024,880, Cl. 428-317.500.
Landreau, Jean; and Nakajima, Hisao, to Etat Francais represente par le Ministre. Method to control the thickness of an antireflection coating and implementation installation. 5,024,853, Cl. 427-10.000.
Lang, Gerard: *See*—
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Lang, Helfried, to Riter Machine Works, Ltd. Sliver guide for a textile machine. 5,023,977, Cl. 19-115.00R.

Lang, Richard D. Resilient metallic friction facing material. 5,024,899, Cl. 428-550.000.
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Robinbrosse, Christian; Naslain, Roger; Minet, Jacky; and Langlais, Francis, 5,024,878, Cl. 428-297.000.
Langlois, Michel: *See—*
Naylor, Robert J.; Naylor, Brenda; Renaud, Alain; and Langlois, Michel, 5,025,022, Cl. 514-305.000.
Lantzsch, Reinhard; Kysela, Ernst; Buchel, Karl H.; Dutzmann, Stefan; Brandes, Wilhelm; and Hanssler, Gerd, to Bayer Aktiengesellschaft. Hydroxyalkinyl-azolyl derivatives. 5,025,030, Cl. 514-383.000.
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Kennedy, Christopher R.; and Newkirk, Marc S., 5,024,795, Cl. 264-59.000.
Newkirk, Marc S.; and Weinstein, Jerry G., 5,024,794, Cl. 264-57.000.
Lapeyre, James M., to Laitram Corporation. Modular center drive conveyor belt. 5,024,321, Cl. 198-853.000.
Larsson, Kåre: *See—*
Gustafsson, Gert-Ove; Berntsson, Leif; and Larsson, Kåre, 5,024,703, Cl. 106-649.000.
Laserscope: *See—*
Kuizenga, Dirk J., 5,025,446, Cl. 372-21.000.
Laska, Eugene M.: *See—*
Sunshine, Abraham; Łaska, Eugene M.; and Siegel, Carole E., 5,025,019, Cl. 514-277.000.
Lassota, Marek J., to Unotech Corporation. Rotary compressor and process of compressing compressible fluids with intake and discharge through piston shaft and piston. 5,024,588, Cl. 418-1.000.
Latos, Thomas S., to Sundstrand Corporation. Inverter switch with parallel free-wheel diodes. 5,025,360, Cl. 363-16.000.
Lauterbach, John H.: *See—*
Dola, Frank P.; Feldman, Steven; Lauterbach, John H.; and Mengelson, William G., 5,024,614, Cl. 439-114.000.
Lazzeri, Paul A.: *See—*
Collins, Glenn B.; Hildebrand, David F.; Lazzeri, Paul A.; Adams, Thomas R.; Parrott, Wayne A.; and Hartweck, Lynn M., 5,024,944, Cl. 435-172.300.
Lean, Gordon D.; and Dennis, Anthony H. K. Motor assisted pedal cycle. 5,024,286, Cl. 180-206.000.
Leary, James J.; and McKenzie, John R., to Cardiovascular Imaging Systems, Inc. Ultrasonic imaging catheter with guidewire channel. 5,024,234, Cl. 128-663.010.
Lecarpentier, Marc: *See—*
Haines, John G.; Rosenbaum, Nolan G.; Pion, Albert L.; Lecarpentier, Marc; Henriot, Christophe; and Abumehdi, Cyrus, 5,025,383, Cl. 364-464.030.
Lecourt, Guy; and Riou, Jacques, to Aerospatiale Societe Nationale Industrielle. Process and machine for manufacturing tubular pieces from at least one web of supple material and tubular pieces thus obtained. 5,024,712, Cl. 156-184.000.
Lectra Systemes S.A.: *See—*
Etcheparre, Jean; and Etchparre, Bernard, 5,024,429, Cl. 270-30.000.
Ledewitz, William. Collapsible dispensing container. 5,024,354, Cl. 222-94.000.
Lee, Byung H.: *See—*
Blyakhman, Yefim; and Lee, Byung H., 5,025,095, Cl. 568-652.000.
Lee Company, The: *See—*
Lee, Leighton, II; and Kolp, Robert J., Jr., 5,023,990, Cl. 29-525.100.
Lee, Hyo-Sam, to SamSung Electronics Co., Ltd. Zebra signal generating circuit of a video camera. 5,025,308, Cl. 358-10.000.
Lee, Kuo H.: *See—*
Billig, James N.; Chlipala, James D.; Lee, Kuo H.; and Nagy, William J., 5,025,300, Cl. 357-51.000.
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Lee, Miko. Tumbler pin lock system. 5,024,072, Cl. 70-491.000.
Lee, Ming-Sheng, to Board of Regents, The University of Texas System, The. Detection of minimal numbers of neoplastic cells carrying DNA translocations by DNA sequence amplification. 5,024,934, Cl. 435-6.000.
Lee, Ruojia; and Ahmad, Aftab A., to Micron Technology, Inc. Blanket punchthrough and field-isolation implant for sub-micron N-channel CMOS devices. 5,024,961, Cl. 437-34.000.
Lee, Seo K.: *See—*
Park, Yong; and Lee, Seo K., 5,024,963, Cl. 437-41.000.
Lee, Shih-Ying, to Setra Systems, Inc. Pressure transducer with flow-through measurement capability. 5,024,099, Cl. 73-730.000.
Lee Shuknecht & Sons, Inc.: *See—*
Shuknecht, Lee N., 5,024,278, Cl. 171-17.000.
Leffel, Harold P. Foldable signal flag and standard assembly. 5,024,179, Cl. 116-173.000.
LeGrange, Jane D.: *See—*
Burack, John J.; LeGrange, Jane D.; and Townsend, Wesley P., 5,024,873, Cl. 428-220.000.
Lehmann, Volker E.: *See—*
Goesele, Ulrich M.; and Lehmann, Volker E., 5,024,723, Cl. 156-628.000.
Lehtonen, Pentti: *See—*
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Lehureau, Jean-Claude: *See—*
Bousquet, Philippe; and Lehureau, Jean-Claude, 5,025,341, Cl. 360-120.000.
Leidenix, Monte. Reel bat. 5,024,050, Cl. 56-220.000.
Leifeld, Ferdinand: *See—*
Clauss, Wolfgang; Kurze, Werner; Leifeld, Ferdinand; and Wassenberg, Willy, 5,024,736, Cl. 204-49.000.
Leist, Alan R., to Pipp Mobile Systems, Inc. Mobile storage system with improved driving assemblies. 5,024,164, Cl. 105-101.000.
Leksell, David; Kun, Zoltan K.; and Asars, Juris A., to Westinghouse Electric Corp. Facsimile machine using thin film electroluminescent device. 5,025,321, Cl. 358-296.000.
Leland Stanford Junior University, The Board of Trustees of the: *See—*
Pauly, John M.; and Nishimura, Dwight G., 5,025,216, Cl. 324-309.000.
LeMahieu, Ronald A.: *See—*
Carson, Matthew; Han, Ru-Jen L.; and LeMahieu, Ronald A., 5,025,036, Cl. 514-568.000.
Lembke, Herbert, to Mannesmann Rexroth GmbH. Control motor for a servo valve. 5,024,247, Cl. 137-82.000.
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Leonakis, George L., to Hughes Aircraft Company. Broadband power divider. 5,025,233, Cl. 333-128.000.
Leone, David A.: *See—*
Allen, Frankie H.; and Leone, David A., 5,025,121, Cl. 200-275.000.
Leong, Robert, to United States of America, Energy. Electrical grounding prong socket. 5,024,602, Cl. 439-107.000.
Le Page, Jean-Francois: *See—*
Giuliani, Pierre; Le Page, Jean-Francois; Plumail, Jean-Claude; and Espaillac, Marcellin, 5,024,751, Cl. 208-108.000.
Lerch, Ulrich: *See—*
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Lericque, Bernard: *See—*
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Lerio Corporation, The: *See—*
Moore, Richard L., 5,024,048, Cl. 53-534.000.
Lerner, Bernard J. Recycle spray gas-liquid contactor. 5,024,686, Cl. 55-259.000.
Les Enterprises Julien Inc.: *See—*
Girardin, Guy; Morin, Pierre; Nguyen, Duy; Nguyen, Duc; and Brunelle, Louise, 5,024,151, Cl. 100-53.000.
Lessard, Robert J.: *See—*
Stierman, Roger J.; and Lessard, Robert J., 5,024,746, Cl. 204-297.00W.
Lester, Wayne L. Compound archery bow. 5,024,206, Cl. 124-23.100.
Leurent, Henri G., to Brelan, S.A. Curved tubular profile. 5,024,040, Cl. 52-738.000.
Lever Brothers Company, Division of Conopco, Inc.: *See—*
Kreischer, Pieter H., 5,024,776, Cl. 252-97.000.
Leverett, William H., to Durand-Wayland, Inc. Weighing and sorting machine and method. 5,024,047, Cl. 53-502.000.
Levinson, Barry L.: *See—*
Donovan, William P.; Gonzalez, Jose M., Jr.; Levinson, Barry L.; and Macaluso, Anthony, 5,024,837, Cl. 424-93.000.
Lewis, Larry N.; and Sumpter, Chris A., to General Electric Company. One part heat curable organopolysiloxane compositions. 5,025,073, Cl. 528-15.000.
Lewis, Mark L.; Sharples, Thomas D.; and Little, Stephen E., to Beckman Instruments, Inc. Optimum fixed angle centrifuge rotor. 5,024,646, Cl. 494-16.000.
Lewis, Robert T.: *See—*
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Ley, Gregor; Schultze, Wolfgang; Vinke, Johannes; and Wistuba, Eckehardt, to BASF Aktiengesellschaft. Coating materials based on synthetic resin. 5,025,062, Cl. 524-556.000.
Leybold Aktiengesellschaft: *See—*
Gesche, Roland; and Vey, Norbert, 5,025,135, Cl. 219-506.000.
Leys, Cassius W., to A.G.P. Systems, Inc. Cleaner for treating a surface. 5,024,780, Cl. 252-162.000.
Li, Mei: *See—*
Chang, Chen-Chi P.; and Li, Mei, 5,024,965, Cl. 437-57.000.
Lignoform Benken AG: *See—*
Birker, Otto, 5,024,290, Cl. 181-293.000.
Lill, Thomas M., to Optical Communications Corp. Optical communications transmitter and receiver. 5,025,459, Cl. 375-117.000.
Lim Kunststoff Technologic Gesellschaft m.b.H.: *See—*
Schmidt, Oskar; and Grunner, Erich, 5,024,800, Cl. 264-502.000.
Lin, Jiang-Jen; and Speranza, George P., to Texaco Chemical Company. Liquid amine terminated derivatives of diglycidyl ethers. 5,025,100, Cl. 549-551.000.
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Scott, Brian L.; Smith, Lloyd A.; Newell, J. Mark; Balentine, Bruce E.; and Lin, Lisan S., 5,025,471, Cl. 381-43.000.
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Brandstrom, Arne E.; Lindberg, Fer L.; and Sunden, Gunnel E., 5,025,024, Cl. 514-338.000.
Linden, Paul R. Bicycle handlebars. 5,024,119, Cl. 74-551.100.
Linder, Charles; Perry, Mordechai; Nemas, Mara; and Katraro, Reuven, to Aligena AG. Composite membranes and processes using them. 5,024,765, Cl. 210-651.000.

Linder, David M.: *See—*
Goodzeit, Neil E.; and Linder, David M., 5,025,381, Cl. 364-434.000.

Lindhuber, Thomas C.; and Campbell, Edward N., to Dana Corporation. Hub cover assembly. 5,024,488, Cl. 301-108.00S.

Lindstrom, Walter W.; and Dinewitz, Isaac, to Picker International, Inc. Dual flow/lambda display for xenon enhanced tomography. 5,024,230, Cl. 128-654.000.

Lingnau, Juergen: *See—*
Wingen, Rainer; Guenther, Dieter; and Lingnau, Juergen, 5,025,097, Cl. 548-235.000.

Linner, John G., to Board of Regents, The University of Texas, The. Method for cryopreparing biological tissue for ultrastructural analysis. 5,024,830, Cl. 424-3.000.

Linton, Howard R., to Du Pont de Nemours, E. I., and Company. Silica particulate composition. 5,024,826, Cl. 423-335.000.

Linz, Wolfgang: *See—*
Oekonomopulos, Raymond; Henning, Rainer; Lerch, Ulrich; Scholkens, Bernward; and Linz, Wolfgang, 5,025,010, Cl. 514-224.200.

Lipkins, Morton S.: *See—*
Bleier, Zvi; and Lipkins, Morton S., 5,024,514, Cl. 350-618.000.

Liston, Thomas V., to Chevron Research Company. Methods for preparing, group II metal overbased sulfurized alkylphenols. 5,024,773, Cl. 252-42.700.

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Crain, Ronald A.; Harney James D.; and Carey, James R., 5,025,436, Cl. 369-77.200.

Little, Cindy E., to Crystals International. Freeze dried sweetened condensed milk crystals and process of making. 5,024,848, Cl. 426-587.000.

Little, Stephen E.: *See—*
Lewis, Mark L.; Sharples, Thomas D.; and Little, Stephen E., 5,024,646, Cl. 494-16.000.

Litzler, Jean, to Fromageries Bel. Packing wrapper for packaging pasty products and pasty product packaged therewith. 5,024,331, Cl. 206-551.000.

Livingston, William H. Uses for the oral use of oak poison preventative in the treatment of: feline leukemia, increased wool production in sheep, and reduction of shipping fever in stressed animals. 5,025,037, Cl. 514-574.000.

Livsey, James D., to Bird Escher Wyss. Cone wear detection. 5,024,755, Cl. 209-211.000.

Llama Precision Inc.: *See—*
Hung, Shih-Ho; and Hsu, Tsui-Chen, 5,024,412, Cl. 248-343.000.

Lloyd, James E. Woodworking machine. 5,024,257, Cl. 144-1.00R.

Lloyd, Larry K. Dowel drilling jig. 5,024,564, Cl. 408-115.00R.

Lloyd, Russell M., to Rusken Machine & Tool Service. Bezel lock, key and receiver assembly. 5,024,073, Cl. 70-491.000.

Lo, Young S.; Walsh, David A.; and Uwaydah, Ibrahim M., to A. H. Robins Co., Inc. Aryl and aryloxyalkyl sulfamate esters useful as anticonvulsants. 5,025,031, Cl. 514-399.000.

Lockheed Missiles & Space Company, Inc.: *See—*
Mende, Stephen B., 5,024,530, Cl. 356-402.000.

Loeber, Peter J.: *See—*
Bannister, Raymond L.; Close, Frederick C.; and Loeber, Peter J., 5,024,153, Cl. 101-91.000.

Loermans, Peter J. G.: *See—*
Rischke, Jorg W.; Loermans, Peter J. G.; and Huvenaars, Peter J. M., 5,024,745, Cl. 204-198.000.

Login, Robert B.: *See—*
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Logsdon, Peter B.; Stachura, Leonard M.; Swan, Ellen L.; and Basu, Bajat S., to Allied-Signal Inc. Azeotrope-like compositions of 1,1-dichloro-1-fluoroethane, dichlorotrifluoroethane, methanol and a mono- or di-chlorinated C_2 or C_3 alkane. 5,024,781, Cl. 252-171.000.

Lohmann, Alfred: *See—*
Ahlborn, Gunter; Budenbender, Herbert; and Lohmann, Alfred, 5,024,166, Cl. 105-453.000.

Loiacono, Marco; and Loviglio, Giuseppe, to Minnesota Mining and Manufacturing Company. Silver halide multilayer color reversal photographic material having improved color reproducibility. 5,024,928, Cl. 430-504.000.

Long Manufacturing Ltd.: *See—*
Cheadle, Brian E.; and Rusiniak, Richard J., 5,024,268, Cl. 165-134.100.

Long Manufacturing N.C., Inc.: *See—*
Furlough, Thomas D., 5,024,281, Cl. 172-219.000.

Long, Robert; and Gottlieb, Mark, to Design Tech International, Inc. Remote automobile starter. 5,024,186, Cl. 123-179.00B.

Looper, Timothy J.; and Sistare, James R., to Ryobi Motor Products Corp. Unitized tool construction. 5,023,999, Cl. 30-390.000.

Lorenz, Otto: *See—*
Reiff, Helmut; and Lorenz, Otto, 5,025,064, Cl. 524-591.000.

Loreth, Andrzej: *See—*
Torok, Vilmos; and Loreth, Andrzej, 5,024,685, Cl. 55-117.000.

Lortz, Allan R.: *See—*
Anthony, James R.; Wiseman, Michael A.; and Lortz, Allan R., 5,023,981, Cl. 24-573.500.

Loscalzo, Joseph; and Cooke, John, to Brigham and Women's Hospital. S-nitroso derivatives of ACE inhibitors and the use thereof. 5,025,001, Cl. 514-91.000.

Loszewski, Raymond C., to Avco Corporation. Surface treatment for silicon carbide filaments and product. 5,024,889, Cl. 428-368.000.

Lotsch, Charles F.: *See—*
Fluent, Stewart L.; Hart, Colin; McCree, Charles D.; and Lotsch, Charles F., 5,024,045, Cl. 53-443.000.

Lougheed, Edgar P.; Richenberg, Carl B.; and Chen, Stephen P., to Eastman Kodak Company. Method of preparing coupler dispersions for photographic use. 5,024,929, Cl. 430-546.000.

Louys, Georges: *See—*
Fischer, Kurt; and Louys, Georges, 5,024,161, Cl. 164-149.000.

Love, Susan F.: *See—*
Rothstein, David M.; Love, Susan F.; and Baum, Ellen Z., 5,024,948, Cl. 435-252.100.

Loviglio, Giuseppe: *See—*
Loiacono, Marco; and Loviglio, Giuseppe, 5,024,928, Cl. 430-504.000.

Lovik, Craig J. Expandable balloon wrapped media display system. 5,024,012, Cl. 40-212.000.

Lowe, Byron L.; Lewis, Robert T.; Milliner, Kenneth M.; and Finn, Everett N., to Brown & Williamson Tobacco Corporation. Dispenser device for removing planar panels from a hopper. 5,024,351, Cl. 221-277.000.

Lubins, Paula M.; and Mroszak, John C. Cartridge holder system. 5,024,510, Cl. 350-321.000.

Lubrizol Corporation, The: *See—*
Piedrahita, Carlos A.; Quinn, Robert E.; and Perz, John S., 5,025,085, Cl. 528-230.000.
Salomon, Mary F., 5,024,774, Cl. 252-47.000.

Lubrizol Genetics, Inc.: *See—*
Collins, Glenn B.; Hildebrand, David F.; Lazzeri, Paul A.; Adams, Thomas R.; Parrott, Wayne A.; and Hartweck, Lynn M., 5,024,944, Cl. 435-172.300.

Lucas, Peter A.; and Casey, Jeremiah P., to Air Products and Chemicals, Inc. Epoxy resin systems containing methyl-2,6,-cyclohexanediamine. 5,025,078, Cl. 528-120.000.

Lucius, John E.: *See—*
Bennett, Glenn E.; Lucius, John E.; Polk, Roger N.; Rider, Frederick H.; and Szczesny, David S., 5,024,627, Cl. 439-631.000.

Ludwig Heumann & Co. GmbH: *See—*
Ahrens, Kurt H.; Schickaneder, Helmut; Engler, Heidrun; and Szeleny, Istvan, 5,025,016, Cl. 514-274.000.

Luftman, Henry S.: *See—*
Kopf, Rose F.; Kuo, J. M.; Luftman, Henry S.; and Schubert, Erdmann F., 5,024,967, Cl. 437-95.000.

Lundell, Vernon J. Automatic sorter. 5,024,335, Cl. 209-618.000.

Lundy, Charles E.: *See—*
Jorissen, Steven A.; Lundy, Charles E.; Krishnan, Sivaram; Mafoti, Robson; and Pyles, Robert A., 5,025,056, Cl. 524-310.000.

Lurssen, Klaus: *See—*
Schallner, Otto; Negele, Michael; Santel, Hans-Joachim; Lurssen, Klaus; Schmidt, Robert R.; and Krauskopf, Birgit, 5,024,694, Cl. 71-95.000.

Lutz, Ferdinand: *See—*
Hahn, Walter; Lutz, Ferdinand; and Jahn, Manfred, 5,024,115, Cl. 74-89.150.

Lux, Eric G.: *See—*
Pettigrew, Michel J.; Rhodes, David B.; Lux, Eric G.; and Mason, Victor A., 5,024,090, Cl. 73-572.000.

Luxem, Heiner: *See—*
Thunker, Norbert; Pollich, Gerhard; and Luxem, Heiner, 5,024,432, Cl. 271-268.000.

Luxtron Corporation: *See—*
Rall, Dieter, 5,024,532, Cl. 374-28.000.

Lynk, Charles N.; and Schorman, Eric R., to Motorola, Inc. TDM/FDM communication system with pseudo-duplex capability. 5,025,442, Cl. 370-29.000.

Lynn, Stephen R.: *See—*
Alberghini, Alfred C.; Brunson, David A.; and Lynn, Stephen R., 5,024,340, Cl. 215-1.00C.

Lyon, John D.: *See—*
Penticoff, Amy M.; and Lyon, John D., 5,024,937, Cl. 435-41.000.

Lyons, Calvin R. Forehead, temple, ear, and neck protector. 5,023,954, Cl. 2-174.000.

Lyons, Patrick J.: *See—*
Abbott, Kenneth E.; and Lyons, Patrick J., 5,024,029, Cl. 51-438.000.

Maas, Henricus G. R.: *See—*
Van Der Velden, Johannes W. A.; Maas, Henricus G. R.; and Van Iersel-Schiffmacher, Marguerite M. C., 5,024,956, Cl. 437-31.000.

Macaluso, Anthony: *See—*
Donovan, William P.; Gonzalez, Jose M., Jr.; Levinson, Barry L.; and Macaluso, Anthony, 5,024,837, Cl. 424-93.000.

MacCarthy, Patrick. Top and propelling element. 5,024,625, Cl. 446-259.000.

Mackal, Glenn H. Apparatus for making inflator parts. 5,024,558, Cl. 425-121.000.

Macri, James. Assessing fetal lung maturity. 5,024,936, Cl. 435-28.000.

Madaus GmbH & Co.: *See—*
Gorler, Klaus; Krumbiegel, Gunter; Hanack, Michael; and Subramanian, Lakshmina R., 5,024,743, Cl. 204-157.690.

Maddahi, Jamshid: *See—*
Berger, Harvey J.; Maddahi, Jamshid; and Berman, Daniel, 5,024,829, Cl. 424-1.100.

Mader, Gerhard: *See—*
Kleinschmidt, Peter; and Mader, Gerhard, 5,025,146, Cl. 250-214.00L.

Maeda, Hirotoshi; and Kunimune, Kouichi, to Chisso Corporation. Photosensitive poly(amide)imide heat-resistant polymer. 5,025,088, Cl. 528-353.000.

Maejima, Hisashi: *See*—
Komoriya, Susumu; Nishizuka, Hiroshi; Nakagawa, Shinya; and Maejima, Hisashi, 5,025,284, Cl. 355-53.000.

Maekawa, Hiroshi: *See*—
Emori, Kiyoshi; and Maekawa, Hiroshi, 5,025,323, Cl. 358-300.000.

Mafoti, Robson: *See*—
Jorissen, Steven A.; Lundy, Charles E.; Krishnan, Sivaram; Mafoti, Robson; and Pyles, Robert A., 5,025,056, Cl. 524-310.000.

Magee, Maynard. Athletic shoe holder. 5,024,408, Cl. 248-206.500.

Maguen, Ezra: *See*—
Nesburn, Anthony B.; Gorin, Michael; Martinez, Marvin; Kenney, M. Cristina; and Maguen, Ezra, 5,024,742, Cl. 204-157.680.

Mahmud, Shahzad. Point of use deionized water purification unit. 5,024,766, Cl. 210-668.000.

Mahulikar, Deepak: *See*—
SinghDeo, Narendra N.; Mahulikar, Deepak; and Butt, Sheldon H., 5,024,883, Cl. 428-323.000.

Maier, Simeon E., II. Fit and cool beverage container. 5,024,067, Cl. 62-457.400.

Maigetter, Robert Z.: *See*—
McAleer, William J.; Maigetter, Robert Z.; and Markus, Henry Z., 5,024,836, Cl. 424-89.000.

Main, Alan J.: *See*—
Bhagwat, Shripad S.; Main, Alan J.; and Rodriguez, Herman R., 5,025,025, Cl. 514-340.000.

Maine, Gregory T.; Daves, Robert S.; and Yocum, Robert R., to BioTechnica International, Inc. Expression and secretion vector for yeast containing a glucoamylase signal sequence. 5,024,941, Cl. 435-69.900.

Mainville, Jack. Trench grate. 5,024,550, Cl. 404-4.000.

Maiorella, Brian: *See*—
Inlow, Duane; and Maiorella, Brian, 5,024,947, Cl. 435-240.310.

Maisonneuve, Jean-Michel; Domergue, Jean-Paul; Parize, Gabrielle; Palandjian, Philippe; and Isbert, Jacques, to Office National d'Etudes et de Recherche Aerospatiales (ONERA); and Societe Nationale Industrielle et Aerospatiale. System to transmit optical information and comprising a plurality of transmitters and receivers connected by optical fibers. 5,024,502, Cl. 350-96.160.

Majima, Toshiaki: *See*—
Suzuki, Hidetoshi; Nomura, Ichiro; Majima, Toshiaki; and Yamamoto, Mitsuru, 5,025,196, Cl. 315-168.000.

Makimoto, Mitsuo: *See*—
Hasegawa, Makoto; Takahashi, Kazuaki; Makimoto, Mitsuo; Takahashi, Masao; and Shimazu, Takayuki, 5,025,229, Cl. 331-107.00A.

Makofka, Stanley J.: *See*—
Glass, Emmett F.; Schoeneberger, Ernest A.; and Makofka, Stanley J., 5,024,051, Cl. 56-297.000.

Malak, Francis R. Apparatus for removing ice from a chopped or cut hole. 5,024,757, Cl. 210-136.000.

Malcolm, David B.; and Bunnelle, William L., to H. B. Fuller Licensing & Financing, Inc. Disposable article construction. 5,024,667, Cl. 604-382.000.

Malin, Jerald R.: *See*—
Dinan, Raymond F.; Fallon, Hugh C.; Malin, Jerald R.; Rodite, Robert R.; Rohe, Clair F.; and Rohrer, Gene D., 5,025,483, Cl. 382-58.000.

Maly, Wojciech P.; and Nigh, Phillip J., to Carnegie Mellon University. Built-in current testing of integrated circuits. 5,025,344, Cl. 361-88.000.

Manabe, Tsuneo: *See*—
Nakamura, Arao; Manabe, Tsuneo; Sugimoto, Naoki; and Usui, Hiroshi, 5,024,974, Cl. 501-57.000.

Manda, Masato: *See*—
Nose, Toshiro; Hashimoto, Hisashi; and Manda, Masato, 5,025,395, Cl. 364-518.000.

Mankin, Erle D.: *See*—
Finn, Leslie E.; Swatling, Donald K.; and Mankin, Erle D., 5,024,782, Cl. 252-174.130.

Mannesmann Aktiengesllschaft: *See*—
Hinzmann, Gerd; Nies, Norbert; and Radewahn, Siegfried, 5,024,811, Cl. 419-66.000.

Mannesmann Rexroth GmbH: *See*—
Lembke, Herbert, 5,024,247, Cl. 137-82.000.
Voxbrunner, Walter, 5,024,417, Cl. 251-129.040.

Maples, D. Ray. Footwear device for hunters. 5,024,008, Cl. 36-136.000.

Marconi Company Limited, The: *See*—
Stafford, Gary P., 5,025,264, Cl. 343-767.000.

Markov, Gennady I.: *See*—
Kozlov, Vladimir S.; Markov, Gennady I.; and Bugrov, Vladimir P., 5,024,658, Cl. 604-96.000.

Marks, Robert J., to Northern Telecom Limited. Overload protector module and building entry protector with integrally molded modular jack. 5,025,345, Cl. 361-119.000.

Markus, Henry Z.: *See*—
McAleer, William J.; Maigetter, Robert Z.; and Markus, Henry Z., 5,024,836, Cl. 424-89.000.

Markuszewski, Richard: *See*—
Chriswell, Colin D.; Markuszewski, Richard; and Buttermore, William H., 5,024,753, Cl. 209-1.000.

Marmonier, Andre : *See*—
Heng, Jean-Paul; and Marmonier, Andre , 5,024,608, Cl. 439-578.000.

Maron, Stanislav. Reticle masking apparatus for a camera and method. 5,024,522, Cl. 352-89.000.

MARPOSS Societa' per Azioni: *See*—
Possati, Mario, 5,024,002, Cl. 33-549.000.

Marquis, Edward T.: *See*—
Sanderson, John R.; Marquis, Edward T.; and Knifton, John F., 5,025,112, Cl. 585-852.000.

Marshall, Eric A.: *See*—
Bryant, Robert G.; Hornak, Joseph P.; and Marshall, Eric A., 5,024,229, Cl. 128-653.0SC.

Martin, Greg L. Illuminated splash guard. 5,025,351, Cl. 362-83.000.

Martin, Jean-Paul: *See*—
Barreau, Michel; Hardy, Jean-Claude; Martin, Jean-Paul; and Renault, Christian, 5,025,013, Cl. 514-253.000.

Martin, John D.: *See*—
Abdelrazik, Mohamed A.; Martin, John D.; and Corcoran, Boyd L., 5,025,262, Cl. 343-705.000.

Martinez, Marvin: *See*—
Nesburn, Anthony B.; Gorin, Michael; Martinez, Marvin; Kenney, M. Cristina; and Maguen, Ezra, 5,024,742, Cl. 204-157.680.

Masaki, Kouichi: *See*—
Endo, Yasushi; Kato, Mikihiko; Kawamata, Toshio; and Masaki, Kouichi, 5,024,885, Cl. 428-329.000.

Masaki, Takashi, to Hirose Electric Co., Ltd. Cable loading machine. 5,023,992, Cl. 29-705.000.

Maschinenfabrik Rieter AG: *See*—
Meyer, Urs; Gartenmann, Niklaus; and Fischer, Roland, 5,023,976, Cl. 19-0.250.

Masciarella, Andrew M.; and Whistler, George R., to Advanced Products International, Inc. Filament holder for a rotating filament vegetation cutter. 5,023,998, Cl. 30-276.000.

Mase, Akira: *See*—
Watanabe, Toshio; Sato, Masahiko; Osabe, Akio; Sakayori, Hiroyuki; and Mase, Akira, 5,024,255, Cl. 141-11.000.

Mason, Charles D.; Sacks, William; Engelmann, Theodore R.; and Verma, Satyajit, to Allied-Signal Inc. Blends of polyamide, polyolefin, and ethylene vinyl alcohol copolymer. 5,024,897, Cl. 428-474.400.

Mason, Victor A.: *See*—
Pettigrew, Michel J.; Rhodes, David B.; Lux, Eric G.; and Mason, Victor A., 5,024,090, Cl. 73-572.000.

Massa, Vincenzo; Cicuta, Aldo; and Cavigiolo, Walter, to Ausimont S.p.A. Process for consolidating discontinuous-structured materials. 5,024,879, Cl. 428-304.400.

Massey, Charles E. Tool for handling a heavy elongate article. 5,024,476, Cl. 294-16.000.

Massey University: *See*—
Thornton, Roy J.; and Rodriguez, Susan B., 5,024,845, Cl. 426-15.000.

Masuda, Tomohiko: *See*—
Matsubara, Ken; Saito, Itaru; Kitano, Hirohisa; Shingaki, Kouichi; and Masuda, Tomohiko, 5,024,511, Cl. 350-356.000.

Masury, David H.: *See*—
Germer, Warren R.; Coryea, Peter F.; Keturakis, Andrius A.; Masury, David H.; and Stevens, Thomas H., 5,025,206, Cl. 324-74.000.

Masuyama, Masaru; Takemae, Yoshihiro; Endoh, Tetsuhiko; Komyoji, Hirosuke; Tanaka, Ryuji; and Itakura, Katsuhiko, to Fujitsu Limited; and Fujitsu Vlsi Limited. Memory card. 5,025,415, Cl. 365-52.000.

Mata, Francisco R. E. Single block for fixing electroconductor cables to vehicle battery terminals. 5,024,621, Cl. 439-771.000.

Mathad, Gangadhara S.; Stanasolovich, David; and Via, Giorgio G., to International Business Machines Corporation. Collimated metal deposition. 5,024,896, Cl. 428-473.500.

Mathewson, Wilfred F.: *See*—
Tu, Roger; Chen, David; and Mathewson, Wilfred F., 5,024,671, Cl. 623-1.000.

Mathur, Sanjay S.; and Fernando, John S., to Unisys Corporation. Hardware implemented cache coherency protocol with duplicated distributed directories for high-performance multiprocessors. 5,025,365, Cl. 364-200.000.

Matschke, Klaus: *See*—
Dinter, Peter; Funke, Hermann; and Matschke, Klaus, 5,024,819, Cl. 422-186.060.

Matsubara, Ken; Saito, Itaru; Kitano, Hirohisa; Shingaki, Kouichi; and Masuda, Tomohiko, to Minolta Camera Kabushiki Kaisha. Display apparatus. 5,024,511, Cl. 350-356.000.

Matsubara, Kenichi: *See*—
Nozaki, Chikateru; Miyanohara, Atsushi; Hamada, Fukusaburo; Ohtomo, Nobuya; and Matsubara, Kenichi, 5,024,938, Cl. 435-68.100.

Matsubara, Kunihiro: *See*—
Ohta, Takeo; Uchida, Masami; Kotera, Koichi; and Matsubara, Kunihiro, 5,024,910, Cl. 430-19.000.

Matsubara, Takashi, to Nikon Corporation. Plate for light shielding blade. 5,025,278, Cl. 354-246.000.

Matsubara, Yoshihiro; and Matsumura, Shuzo, to NGK Spark Plug Co., Ltd. Temperature sensor for use in a spark plug of an internal combustion engine. 5,024,534, Cl. 374-144.000.

Matsubayashi, Takayuki: *See*—
Saito, Yasuo; Yahata, Mitsuru; Honjo, Kouji; and Matsubayashi, Takayuki, 5,025,463, Cl. 378-19.000.

Matsuda, Koichi: *See*—
Kanai, Masahiro; Aoike, Tatsuyuki; Matsuda, Koichi; and Kawakami, Soichiro, 5,024,706, Cl. 136-258.000.

Matsui, Toshio: *See*—
Ishii, Akihiko; Honda, Yukihiro; and Matsui, Toshio, 5,025,202, Cl. 320-32.000.
Matsumoto, Fukuji; Tawara, Yoshio; Hayashi, Michio; and Yamada, Osamu, to Shin-Etsu Chemical Co., Ltd. Semiconductor diffusion furnace inner tube. 5,024,423, Cl. 266-283.000.
Matsumoto, Masakazu: *See*—
Neishi, Toshie; Kikuchi, Toshihiro; Takiguchi, Takao; Suzuki, Koichi; and Matsumoto, Masakazu, 5,024,912, Cl. 430-59.000.
Matsumoto, Takehiko: *See*—
Sone, Toshiyuki; Matsumoto, Takehiko; Omotezako, Nobuya; and Kawasuji, Keiji, 5,025,338, Cl. 360-99.060.
Matsumura, Shuzo: *See*—
Matsubara, Yoshihiro; and Matsumura, Shuzo, 5,024,534, Cl. 374-144.000.
Matsuo, Haruyuki: *See*—
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Yamaguchi, Kimiaki, 5,025,489, Cl. 219-10.55B.
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Scata, Mario; and Passero, Adolfo, 5,024,316, Cl. 198-369.000.
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Menaged, David L. Adjustable reading stand and light assembly. 5,025,353, Cl. 362-98.000.
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Riemer, Horst H., 5,024,339, Cl. 215-1.00C.
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Lee, Ruojia; and Ahmad, Aftab A., 5,024,961, Cl. 437-34.000.
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Merry, Richard P., 5,024,289, Cl. 181-231.000.
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Veasley, George F.; Klingen, Jurgen; and Landin, Donald T., 5,024,880, Cl. 428-317.500.
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Murano, Katsuaki; Yamashita, Yoshinori; Hirano, Sadayuki; Tatsumi, Takumi; and Yamamoto, Hiroaki, 5,024,310, Cl. 192-0.076.
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Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Moriyama, Noboru; Ogura, Tsugitoshi; and Hiraki, Akio, 5,024,676, Cl. 44-301.000.

Mitsubishi Kasei Corporation: *See—*
Kishiro, Osamu; Kamata, Hiroshi; and Sakai, Hideko, 5,025,082, Cl. 528-190.000.

Mitsubishi Kinzoku Kabushiki Kaisha: *See—*
Tsunashima, Makoto; Uchida, Hiroto; Sakai, Kazuhiro; and Miyauchi, Masato, 5,024,991, Cl. 505-1.000.

Mitsubishi Paper Mills Limited: *See—*
Katsura, Toru; Kaji, Hiroo; Hyodo, Kenji; and Ohkura, Hirokazu, 5,024,986, Cl. 503-200.000.

Mitsubishi Plastics Industries limited: *See—*
Yoshiga, Norio; Kawamura, Masahiro; and Nonoyama, Hiroshi, 5,024,891, Cl. 428-414.000.

Mitsubishi Rayon Company Limited: *See—*
Funato, Ryo; Takahiro, Syuji; Yoshida, Keiji; Kubo, Shinji; and Inagaki, Motoshi, 5,024,914, Cl. 430-109.000.

Mitsubishi Shindoh Co., Ltd.: *See—*
Futatasuka, Rensei; Koshiba, Yutaka; Chiba, Shunich; Orikasa, Toyoaki; Noguchi, Seiji; and Idoshita, Takuya, 5,024,814, Cl. 420-473.000.

Mitsui Petrochemical Industries, Ltd.: *See—*
Shigemori, Hiromi, 5,025,057, Cl. 524-423.000.
Yamamoto, Yohzoh; Suzuki, Goro; Nakamura, Hideo; and Yasuda, Kiyomi. 5,025,067, Cl. 525-109.000.

Mitsui Toatsu Chemicals, Incorporated: *See—*
Itoh, Hisato; Enomoto, Katashi; Oguchi, Takahisa; and Nishizawa, Tsutomu, 5,024,926, Cl. 430-495.000.

Mitsuishi, Akio; Takeuchi, Takashi; and Koshiishi, Osamu, to Seiko Epson Corporation. Impact dot print head. 5,024,543, Cl. 400-124.000.

Mittel, James G.; and Davis, Walter L., to Motorola, Inc. Self-tuning direct coupled data limiter of a battery saver type paging receiver. 5,025,251, Cl. 340-825.440.

Miura, Asahiko: *See—*
Terada, Masayuki; Saito, Shinji; and Miura, Asahiko, 5,024,908, Cl. 429-245.000.

Miura, Isamu. Paper arranging system. 5,024,577, Cl. 414-788.400.

Miura, Katsutoshi; Koyama, Hiroyasu; Sugai, Toshiji; Yamada, Hiroaki; and Sakurai, Einosuke, to Nisshin Flour Milling Co., Ltd. Nicotinic acid derivatives and pharmaceutical compositions comprising same. 5,025,012, Cl. 514-252.000.

Miura, Kiyoshi: *See—*
Morishita, Hajime; Hayashi, Nobuaki; Nonogaki, Saburo; Hashimoto, Michiaki; Ito, Masato; Nishizawa, Masahiro; Miura, Kiyoshi; and Odaka, Yoshiyuki, 5,024,920, Cl. 430-325.000.

Miura, Masao; Uchida, Naoshi; Takahashi, Tatsunori; Asakawa, Kouji; and Nozawa, Eiji, to Fuji Electric Co., Ltd. Circuit breaker. 5,025,236, Cl. 335-46.000.

Miwa, Kenji: *See—*
Arai, Kei; Ohashi, Minoru; Utsugi, Yoshio; Oka, Osamu; Numazawa, Kenichi; Miwa, Kenji; and Sugawara, Kenzo, 5,024,816, Cl. 422-68.100.

Miyakawa, Shinji; and Ito, Michio, to Tokai Rubber Industries, Ltd. Upper support for shock absorber in suspension system, having elastically supported resonance member. 5,024,461, Cl. 280-710.000.

Miyake, Shiro: *See—*
Yasui, Yoshiharu; Anahara, Meiji; Asahi, Goro; and Miyake, Shiro, 5,024,874, Cl. 428-257.000.

Miyamoto, Junichi; Ohtsuka, Nobuaki; Yoshikawa, Kuniyoshi; and Mori, Seiichi, to Kabushiki Kaisha Toshiba. Semiconductor memory device capable of preventing data of non-selected memory cell from being degraded. 5,025,417, Cl. 365-189.090.

Miyamoto, Yuzo: *See—*
Yabuta, Motoshi; Nakao, Yasushi; Sugiura, Shinji; Fukuda, Mitsuhiro; and Miyamoto, Yuzo, 5,025,060, Cl. 524-533.000.

Miyanohara, Atsushi: *See—*
Nozaki, Chikateru; Miyanohara, Atsushi; Hamada, Fukusaburo; Ohtomo, Nobuya; and Matsubara, Kenichi, 5,024,938, Cl. 435-68.100.

Miyata, Yukitaka; Wada, Hiroyuki; and Nishimura, Takashi, to Kabushiki Kaisha Toshiba. Exposure apparatus for color cathode ray tubes. 5,025,166, Cl. 250-492.100.

Miyauchi, Masato: *See—*
Tsunashima, Makoto; Uchida, Hiroto; Sakai, Kazuhiro; and Miyauchi, Masato, 5,024,991, Cl. 505-1.000.

Miyazaki, Hiroaki: *See—*
Inoue, Takashi; Suzuki, Tatsuya; Kimura, Akiteru; Miyazaki, Hiroaki; and Katagiri, Moriya, 5,025,277, Cl. 354-173.100.

Miyazaki, Masao: *See—*
Ohta, Tomozo; Nakano, Hiroshi; and Miyazaki, Masao, 5,025,261, Cl. 342-357.000.

Miyazaki, Osamu: *See—*
Iiyama, Kiyotaka; Hayakawa, Kunio; Nakata, Masahiro; Kodera, Kaoru; and Miyazaki, Osamu, 5,024,699, Cl. 106-21.000.

Miyazawa, Tadashi, to Sanden Coporation. Coin return control system for vending machines. 5,024,313, Cl. 194-217.000.

Mizukami, Makoto, to Victor Company of Japan, Ltd. Magnetic recording medium having a magnetic layer of a quaternary alloy. 5,024,903, Cl. 428-694.000.

Mizuno, Genji: *See—*
Nishii, Michiharu; Mizuno, Genji; Nomura, Yoshihisa; and Kato, Masahiko, 5,024,492, Cl. 303-114.000.

Mizutani, Ken-ichiro: *See—*
Yamaguchi, Shigeru; and Mizutani, Ken-ichiro, 5,024,267, Cl. 165-122.000.

MK-Ferguson Company: *See—*
Oldham, James G.; Spencer, Charles R.; Begley, Carl L.; and Meyer, H. Robert, 5,025,150, Cl. 250-253.000.

Mobay Corporation: *See—*
Jorissen, Steven A.; Lundy, Charles E.; Krishnan, Sivaram; Mafoti, Robson; and Pyles, Robert A., 5,025,056, Cl. 524-310.000.

Moberg, Hans: *See—*
Inge, Claes; Franzen, Peter; Lagerstedt, Torgny; Borgstrom, Leonard; Carlsson, Claes-Goran; Moberg, Hans; and Näbo, Olle, 5,024,648, Cl. 494-56.000.

Mobil Oil Corporation: *See—*
DeCaul, Lorenzo C.; Han, Scott; Palermo, Robert E.; and Walsh, Dennis E., 5,025,109, Cl. 585-500.000.
Harandi, Mohsen N.; and Owen, Hartley, 5,024,679, Cl. 44-449.000.
Nowlin, Thomas E.; and Wagner, Klaus P., 5,025,072, Cl. 526-129.000.
Yan, Tsoung Y., 5,024,752, Cl. 208-131.000.

Mochinaga, Nobuyuki: *See—*
Tsukada, Shuya; Mochinaga, Nobuyuki; and Kanoe, Yasuo, 5,024,541, Cl. 400-88.000.

Mochizuki, Takeshi: *See—*
Arimoto, Akira; Saito, Susumu; Tsunoda, Yoshito; Moriyama, Shigeo; and Mochizuki, Takeshi, 5,025,268, Cl. 346-108.000.

Modena, Silvana; and Strepparola, Ezio, to AUSIMONT S.r.l. Process for preparing bromodifluoroacetylfluoride. 5,025,105, Cl. 562-851.000.

Mogavero, Annabelle: *See—*
Motola, Solomon; Agisim, Gary R.; and Mogavero, Annabelle, 5,024,997, Cl. 514-58.000.

Mohtar, Rafic: *See—*
Reinicke, Robert H.; Mohtar, Rafic; and Nelson, Richard O., 5,024,418, Cl. 251-129.110.

Molex Incorporated: *See—*
Kachlic, Jerry D., 5,024,607, Cl. 439-567.000.

Molins PLC: *See—*
Brink, Andre; Cahill, Michael J.; Dawson, John; Gardner, Juilian W.; and Thierry, Alan A., 5,024,333, Cl. 209-535.000.

Molle, Roger: *See—*
Gerard, Evelyne; Molle, Roger; and Debaisieux, Andre, 5,025,228, Cl. 331-69.000.
Monsanto Company: *See—*
Fleet, George W. J., 5,025,098, Cl. 548-453.000.
Getman, Daniel P.; and DeCrescenzo, Gary A., 5,025,021, Cl. 514-302.000.
Kavanagh, Dean L.; and Simon, Robert H. M., 5,024,895, Cl. 428-437.000.
Montanari, Stefania: *See—*
Casagrande, Cesare; Montanari, Stefania; and Santangelo, Francesco, 5,025,011, Cl. 514-234.200.
Monteiro, Daniel: *See—*
Petit, Gaston; and Monteiro, Daniel, 5,024,147, Cl. 99-549.000.
Moore Business Forms, Inc.: *See—*
Ashby, Robert E., 5,024,374, Cl. 229-71.000.
Moore, Richard L., to Lerio Corporation, The. Apparatus for dispensing containers. 5,024,048, Cl. 53-534.000.
Moore, Wayne D.: *See—*
Raikes, Terry E.; Kramer, William L.; Howard, John B.; Moore, Wayne D.; Jackson, Louis; and Kotecki, Jeffrey D., 5,024,282, Cl. 177-25.150.
Moran, David: *See—*
Morris, Octavius J.; and Moran, David, 5,025,478, Cl. 382-22.000.
Mordue, George S.; and Ritchie, Herbert L., Jr., to Carborundum Company, The. Torque coupling system for graphite impeller shafts. 5,025,198, Cl. 318-434.000.
Morehead, William C. Wallet. 5,024,258, Cl. 150-140.000.
Morehouse, James H.; Furay, David M.; Blagaila, John; Dion, F. Eugene; Shelstad, Scott A.; and Woods, Jimmy L., to Prairietek Corporation. Disk drive apparatus. 5,025,336, Cl. 360-97.020.
Morgan, Wayne A., to Siemens-Pacesetter, Inc. Programmable bandpass amplifier for use with implantable medical device. 5,024,221, Cl. 128-419.0PG.
Mori, Daisuke: *See—*
Nakanishi, Masahiro; Mori, Daisuke; Fujii, Katsuyoshi; Hatanaka, Masahiko; and Shinada, Hiroko, 5,024,133, Cl. 84-615.000.
Mori, Goro: *See—*
Seki, Nobuyoshi; Morii, Nobuyuki; Sugiyama, Yoshihide; Komada, Takashi; Hosoi, Masatoshi; Hujiwara, Atuhisa; Ichinose, Tsutomu; Mori, Goro; Kikuchi, Toshiyuki; and Minato, Masahiro, 5,024,430, Cl. 270-53.000.
Mori, Kazuyuki: *See—*
Etoh, Yoshiyuki; Inoue, Hiroshi; Mori, Kazuyuki; Suzuki, Koichi; Nakano, Kinichiro; Nomura, Hiroyuki; Yamamoto, Isao; and Yoshida, Kiyoshi, 5,025,379, Cl. 364-426.040.
Mori, Masataka, to Mitsubishi Denki Kabushiki Kaisha. Method of obtaining semiconductor chips. 5,024,970, Cl. 437-226.000.
Mori, Seiichi: *See—*
Miyamoto, Junichi; Ohtsuka, Nobuaki; Yoshikawa, Kuniyoshi; and Mori, Seiichi, 5,025,417, Cl. 365-189.090.
Moriguchi, Hideyuki: *See—*
Tanaka, Nobuhiro; Hirata, Eiji; Moriguchi, Hideyuki; Azekura, Ko; Tsubone, Akira; and Ryu, Yasunori, 5,024,572, Cl. 414-276.000.
Morii, Nobuyuki: *See—*
Seki, Nobuyoshi; Morii, Nobuyuki; Sugiyama, Yoshihide; Komada, Takashi; Hosoi, Masatoshi; Hujiwara, Atuhisa; Ichinose, Tsutomu; Mori, Goro; Kikuchi, Toshiyuki; and Minato, Masahiro, 5,024,430, Cl. 270-53.000.
Morikawa, Atsushi: *See—*
Yonezawa, Yasuo; Ohnishi, Toshiya; Okumura, Shin-ichi; Sakai, Akiyoshi; Nakano, Hiroki; Matsushita, Masao; Morikawa, Atsushi; and Yoshihara, Motoshi, 5,024,064, Cl. 62-106.000.
Morin, Pierre: *See—*
Girardin, Guy; Morin, Pierre; Nguyen, Duy; Nguyen, Duc; and Brunelle, Louise, 5,024,151, Cl. 100-53.000.
Morishima, Morito: *See—*
Ubayama, Takashi; Suzuki, Eiichi; and Morishima, Morito, 5,025,173, Cl. 307-265.000.
Morishita, Hajime; Hayashi, Nobuaki; Nonogaki, Saburo; Hashimoto, Michiaki; Ito, Masato; Nishizawa, Masahiro; Miura, Kiyoshi; and Odaka, Yoshiyuki, to Hitachi, Ltd. Process for forming a pattern using a photosensitive azide and a high-molecular weight copolymer or polymer. 5,024,920, Cl. 430-325.000.
Morita, Seizo: *See—*
Okada, Takao; Yagi, Akira; Morita, Seizo; and Mikoshiba, Nobuo, 5,025,153, Cl. 250-306.000.
Morita, Toshio: *See—*
Impink, Albert J., Jr.; Grobmyer, Louis R.; Sariscak, Robert E.; Morita, Toshio; and Duryea, John L., 5,024,801, Cl. 376-217.000.
Morita, Tsuyoshi; Shimazu, Kyotaro; and Furukawa, Masataka, to Dainippon Ink and Chemicals, Inc. Devolatilization of liquid composition containing polymer and volatile constituents. 5,024,728, Cl. 159-27.400.
Morita, Yoshiyuki, to Seiko Instruments, Inc. Coordinate reading apparatus. 5,025,410, Cl. 364-900.000.
Moriwaki, Nobuyuki; Higuchi, Mitsuhiro; and Toshita, Mitsuhiro, to Hitachi, Ltd.; and Hitachi VLSI Engineering Corp. Semiconductor memory device. 5,025,422, Cl. 365-233.500.
Moriya, Takashi: *See—*
Nagahiro, Kenichi; and Moriya, Takashi, 5,024,191, Cl. 123-198.00D.
Moriyama, Masahiro: *See—*
Tsuchida, Takefumi; Yoshida, Minoru; Kodama, Yoshimi; and Moriyama, Masahiro, 5,025,332, Cl. 360-85.000.
Moriyama, Noboru; Ogura, Tsugitoshi; and Hiraki, Akio, to Kao Corporation; and Mitsubishi Jukogyo Kabushiki Kaisha. Super-heavy oil emulsion fuel. 5,024,676, Cl. 44-301.000.
Moriyama, Shigeo: *See—*
Arimoto, Akira; Saito, Susumu; Tsunoda, Yoshito; Moriyama, Shigeo; and Mochizuki, Takeshi, 5,025,268, Cl. 346-108.000.
Mork, Orlan H. Soil leveling apparatus with improved frame and hitch. 5,024,280, Cl. 172-197.000.
Morris, Alvin L., to PFM, Inc. Tire converting apparatus and method. 5,024,386, Cl. 241-3.000.
Morris, Donald E., to University of California, The Regents of the. Preparation of highly oxidized $RBa_2Cu_4O_8$ superconductors. 5,024,992, Cl. 505-1.000.
Morris, Octavius J.; and Moran, David, to U.S. Philips Corp. Method and apparatus for detecting false edges in an image. 5,025,478, Cl. 382-22.000.
Morrison, Andrew L, to Knoll International, Inc. Space divider system. 5,024,030, Cl. 52-36.000.
Morrow, Raymond W.: *See—*
Stamness, Jesse I.; Morrow, Raymond W.; and Asato, Edward E., 5,025,327, Cl. 360-45.000.
Morton, Roger A.; and Wetzel, Thomas J., to Eastman Kodak Company. Background referencing. 5,025,480, Cl. 382-50.000.
Mortreux, Andre: *See—*
Paumard, Eric; Mutez, Sylvain; Mortreux, Andre; and Petit, Francis, 5,024,983, Cl. 502-167.000.
Mosberg, Kaare. Manually adjustable ropes suspended therefrom. 5,024,433, Cl. 272-120.000.
Moses, Darcy, to Crown Iron Works Company. Coating removal device for granular materials. 5,024,148, Cl. 99-618.000.
Moss, Mary G.; Brewer, Terry; Cuzmar, Ruth M.; Hawley, Dan W.; and Flaim, Tony D. Positive working polyamic acid/imide and diazoquinone photoresist with high temperature pre-bake. 5,024,922, Cl. 430-330.000.
Mostert, Simone: *See—*
Hwo, Charles C.; and Mostert, Simone, 5,024,888, Cl. 428-355.000.
Motoda, Takashi: *See—*
Aoyagi, Toshitaka; and Motoda, Takashi, 5,025,450, Cl. 372-46.000.
Motola, Solomon; Agisim, Gary R.; and Mogavero, Annabelle, to American Home Products Corporation. Palatable ibuprofen solutions. 5,024,997, Cl. 514-58.000.
Motorola, Inc.: *See—*
Altman, Leonard F.; Flaugher, Jill L.; Suppelsa, Anthony B.; and Mullen, William B., III, 5,024,372, Cl. 228-248.000.
Baker, Frank K.; and Hayden, James D., 5,024,971, Cl. 437-228.000.
DeLuca, Michael J.; Snowden, Gregory O.; and Fennell, Robert D., 5,025,252, Cl. 340-825.440.
DePinto, Gary A.; Steinberg, Joe; Franka, John G.; and Cherniawski, Michael R., 5,024,972, Cl. 437-233.000.
Edwards, Arthur J., 5,025,203, Cl. 323-268.000.
Fay, Gary V.; Robb, Stephen P.; Sutor, Judith L.; and Terry, Lewis E., 5,025,298, Cl. 357-41.000.
Frane, Terrie L., 5,025,387, Cl. 364-493.000.
Fullerton, Craig L.; and Seely, Warren L., 5,025,296, Cl. 357-23.800.
Harbarger, Josephine A.; Oliver, David; and Anthony, Ella L., 5,024,207, Cl. 125-35.000.
Hess, David W., 5,025,254, Cl. 340-826.000.
Lynk, Charles N.; and Schorman, Eric R., 5,025,442, Cl. 370-29.000.
Mittel, James G.; and Davis, Walter L., 5,025,251, Cl. 340-825.440.
Pfiester, James R., 5,024,959, Cl. 437-34.000.
Mould, David, to H. Bollmann Manufacturers Limited. Secure keyboard with random order of key interrogation. 5,025,255, Cl. 341-26.000.
Mounger, Robert W., to Dallas Semiconductor Corporation. Sensitive low power comparator. 5,025,177, Cl. 307-355.000.
Mouren, Michel: *See—*
Demoute, Jean-Pierre; Touyer, Gaetan; and Mouren, Michel, 5,024,828, Cl. 424-1.100.
Mouri, Hiroshi; and Araki, Shunji, to Bridgestone Corporation. Pneumatic tires with tread comprising a blend of isoprene rubber, high-transpolybutadiene rubber and carbon black. 5,025,059, Cl. 524-495.000.
Moyer, Ralph S.: *See—*
Dietrich, Norman R.; Moyer, Ralph S.; and Wong, Yiu-Huen, 5,024,966, Cl. 437-60.000.
MRJ Group, Inc.: *See—*
Dalby, James F., 5,024,549, Cl. 403-404.000.
Mroszak, John C.: *See—*
Lubins, Paula M.; and Mroszak, John C., 5,024,510, Cl. 350-321.000.
Mueller, Carl F.: *See—*
Garg, Diwakar; Dyer, Paul N.; Schaffer, Leslie E.; Wrecsics, Ernest L.; Dimos, Duane; and Mueller, Carl F., 5,024,901, Cl. 428-627.000.
Mueller, Wolfgang: *See—*
Kuesters, Karl-Heinz; Mueller, Wolfgang; and Enders, Gerd, 5,025,295, Cl. 357-23.600.
Mueller, Wolfgang F.; Popp, George; and Vanderghevnst, George B., to International Business Machines Corporation. Punching mechanism. 5,024,127, Cl. 83-13.000.
Mui, Paul Y. H.; and Tso, Rosa Y. M. Writing utensil with notepaper. 5,024,547, Cl. 401-195.000.
Mullen, William B., III: *See—*
Altman, Leonard F.; Flaugher, Jill L.; Suppelsa, Anthony B.; and Mullen, William B., III, 5,024,372, Cl. 228-248.000.

Muller, Fritz. Piston drive. 5,024,144, Cl. 92-13.500.
Muller, Heinrich: *See—*
Mertens-Gottselig, Dagmar; Hammer, Hartmut; Muller, Heinrich; and Wildersohn, Manfred, 5,024,678, Cl. 44-348.000.
Muller, Roland: *See—*
Bauer, Walter; and Muller, Roland, 5,025,465, Cl. 378-169.000.
Multilink, Inc.: *See—*
Kaplan, Steve E., 5,023,995, Cl. 30-90.100.
Multistructure Sweden AB: *See—*
Gustafsson, Gert-Ove; Berntsson, Leif; and Larsson, Kåre, 5,024,703, Cl. 106-649.000.
Mulvey, Philip, to Euroflex, S.A. Faucet connector assembly. 5,024,419, Cl. 251-148.000.
Murai, Kazuaki: *See—*
Genda, Kohei; and Murai, Kazuaki, 5,025,413, Cl. 364-900.000.
Murakami, Michiyuki: *See—*
Yamada, Ichiji; Inuzuka, Yutaka; Murakami, Michiyuki; Suzuki, George; Tanahashi, Tyo; and Kondo, Takeshi, 5,024,117, Cl. 74-473.00P.
Murakami, Satoru; Yamaguchi, Minori; Hayashi, Akimine; Kondo, Masataka; and Tawada, Yoshihisa, to Kanegafuchi Chemical Industry Co., Ltd. Semiconductor light beam position sensor element and a position sensor and a picture image input device each using the same. 5,025,297, Cl. 357-30.000.
Murakami, Tokumichi; Asai, Kohtaro; and Matsuzaki, Kazuhiro, to Mitsubishi Denki Kabushiki Kaisha. Image transformation coding device with adaptive quantization characteristic selection. 5,025,482, Cl. 382-56.000.
Muramatsu, Hajime: *See—*
Nagasaki, Wataru; Endo, Takuro; Taira, Susumu; and Muramatsu, Hajime, 5,024,087, Cl. 73-516.00R.
Murano, Katsuaki; Yamashita, Yoshinori; Hirano, Sadayuki; Tatsumi, Takumi; and Yamamoto, Hiroaki, to Suzuki Jidosha Kogyo Kabushiki Kaisha; and Mitsubishi Denki Kabushiki Kaisha. Clutch pressure control device for continuously variable transmission. 5,024,310, Cl. 192-0.076.
Murata Kikai Kabushiki Kaisha: *See—*
Uchida, Hiroshi; and Kubota, Norio, 5,024,392, Cl. 242-128.000.
Murata, Kosaku: *See—*
Tanaka, Tsuneo; Sato, Kazue; Takewa, Hiroyuki; Kurozuka, Akira; Tamura, Tadashi; Hattori, Katsuji; Takayama, Satoshi; Murata, Kosaku; Satoh, Katsuaki; Serikawa, Mituhiko; Kimura, Youichi; and Obata, Shuichi, 5,025,474, Cl. 381-90.000.
Murata, Toshinori: *See—*
Sekiya, Hiroshi; Kurita, Toshiyuki; Nakagaki, Nobufumi; and Murata, Toshinori, 5,025,310, Cl. 358-19.000.
Muroi, Shoji: *See—*
Okamoto, Kengo; Habu, Takaaki; and Muroi, Shoji, 5,025,263, Cl. 343-715.000.
Murphy, John A., II; and Westgate, Charles A., to Gentex Corporation. Impact-absorbing sound-attenuating earcup. 5,023,955, Cl. 2-209.000.
Murphy, Kent A.: *See—*
Richards, David W.; and Murphy, Kent A., 5,024,518, Cl. 351-219.000.
Murray, Alexander P., to Westinghouse Electric Corp. Method for decontaminating a pressurized water nuclear reactor system. 5,024,805, Cl. 376-305.000.
Murray, Darlene G. Coin holder/dispenser. 5,024,629, Cl. 453-54.000.
Murray, Roger W.; and Godhwani, Nevand, to Teledyne Industries, Inc. Method for preventing auto-doping in the fabrication of metal gate CMOS devices. 5,024,962, Cl. 437-40.000.
Musante, Louis P., to Musante, Louis P.; and Musante, Lynda S. Needlepoint sheet having octagonal openings and method of use thereof. 5,024,176, Cl. 112-266.100.
Musante, Lynda S.: *See—*
Musante, Louis P., 5,024,176, Cl. 112-266.100.
Musha, Yoshinori: *See—*
Sasaki, Souji; Kino, Hirotoshi; Musha, Yoshinori; Kubota, Jun; and Okada, Hisao, 5,024,093, Cl. 73-633.000.
Musha, Yosinori: *See—*
Kubota, Jun; Kino, Hirotoshi; Musha, Yosinori; and Okada, Hisao, 5,024,094, Cl. 73-634.000.
Musschoot, Albert, to General Kinematics Corporation. Vibratory spiral elevator. 5,024,320, Cl. 198-756.000.
Mutez, Sylvain: *See—*
Paumard, Eric; Mutez, Sylvain; Mortreux, Andre; and Petit, Francis, 5,024,983, Cl. 502-167.000.
Muto, Jiro: *See—*
Suzuki, Satoshi; Kuwabara, Osamu; Muto, Jiro; and Shinozaki, Eiichi, 5,025,348, Cl. 361-398.000.
Mutoh, Hideki; Oda, Kazuya; and Kawajiri, Kazuhiro, to Fuji Photo Film Co., Ltd. Solid state image pickup device driving method utilizing an electronic shutter operation. 5,025,319, Cl. 358-213.290.
Mydill, Marc R.; Pile, Sam R.; O'Keefe, Sheila; Okerblom, Neal F.; and Keenan, W. Russ, to Texas Instruments Incorporated. Reconfigurable architecture for logic test system. 5,025,205, Cl. 324-73.100.
Myers, John R.: *See—*
Hadley, Howard C.; and Myers, John R., 5,024,456, Cl. 280-412.000.
Myung, Chan K.: *See—*
Kim, Heung S.; and Myung, Chan K., 5,025,180, Cl. 307-475.000.
N. E. Chemcat Corporation: *See—*
Itoh, Takashi; and Katoh, Katsuaki, 5,024,905, Cl. 429-44.000.
Nagahiro, Kenichi; and Moriya, Takashi, to Honda Giken Kogyo Kabushiki Kaisha. Control system for a variable valve actuating mechanism of an internal combustion engine. 5,024,191, Cl. 123-198.00D.
Nagai, Takeshi: *See—*
Natori, Katsuhide; Watanabe, Isao; Katsuyama, Koji; Kawamura, Isao; Yamamoto, Karuhiko; and Nagai, Takeshi, 5,024,264, Cl. 165-1.000.
Nagano, Susumu; Kawazoe, Hiromitsu; and Ohsawa, Katsuyuki, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Direct fuel injection internal combustion engine. 5,024,184, Cl. 123-48.00R.
Nagano Technical Service Co., Ltd.: *See—*
Saitoh, Takashi, 5,024,640, Cl. 493-127.000.
Nagaoka, Akinobu: *See—*
Goto, Giichi; and Nagaoka, Akinobu, 5,025,033, Cl. 514-417.000.
Nagare, Arthur T.: *See—*
Saluja, Raja; and Nagare, Arthur T., 5,025,359, Cl. 362-402.000.
Nagasaki, Wataru; Endo, Takuro; Taira, Susumu; and Muramatsu, Hajime, to Diesel Kiki Co., Ltd. Acceleration sensor. 5,024,087, Cl. 73-516.00R.
Nagata, Hisako: *See—*
Nagata, Katsumi; and Nagata, Hisako, 5,024,731, Cl. 203-99.000.
Nagata, Katsumi; and Nagata, Hisako. Method of manufacturing material for medical and pharmaceutical products from pyroligneous acid. 5,024,731, Cl. 203-99.000.
Nagata, Yuji; and Fukazawa, Toshio, to Matsushita Electric Industrial Co., Ltd. Thin-film magnetic head device for recording and reproducing. 5,025,342, Cl. 360-126.000.
Nagato, Shoin; Taguchi, Ryusuke; Hirai, Kenji; Hirose, Hiroaki; and Yokota, Masahiro, to Kaken Pharmaceutical Co., Ltd.; Sagami Chemical Research Center; and Chisso Corporation. Herbicidal composition and herbicidal method. 5,024,692, Cl. 71-86.000.
Nagel, Dietmar: *See—*
Robbins, Jack; and Nagel, Dietmar, 5,024,626, Cl. 446-409.000.
Nagubandi, Sreeramulu, to ICI Americas Inc. Substituted phenoxy benzamide herbicides and methods of use. 5,024,691, Cl. 71-86.000.
Nagura, Riichi, to NEC Corporation. Imaging apparatus with means for cancelling differential offset voltage. 5,025,318, Cl. 358-213.150.
Nagy, William J.: *See—*
Billig, James N.; Chlipala, James D.; Lee, Kuo H.; and Nagy, William J., 5,025,300, Cl. 357-51.000.
Naito, Ryuichi, to Pioneer Electronic Corporation. Autochanger of writable discs. 5,025,431, Cl. 369-36.000.
Naito, Ryuichi, to Pioneer Electronic Corporation. Autochanger of writable discs including a non-volatile memory for storing most recent defect management information relating to the writable discs. 5,025,432, Cl. 369-36.000.
Naito, Tatsuo, to Nissan Motor Co., Ltd. Teaching apparatus. 5,025,393, Cl. 364-513.000.
Nakagaki, Nobufumi: *See—*
Sekiya, Hiroshi; Kurita, Toshiyuki; Nakagaki, Nobufumi; and Murata, Toshinori, 5,025,310, Cl. 358-19.000.
Nakagaki, Shintaro: *See—*
Takanashi, Itsuo; Nakagaki, Shintaro; Shinonaga, Hirohiko; Asakura, Tsutou; Furuya, Masato; and Tai, Hiromichi, 5,025,209, Cl. 324-96.000.
Nakagawa, Shinya: *See—*
Komoriya, Susumu; Nishizuka, Hiroshi; Nakagawa, Shinya; and Maejima, Hisashi, 5,025,284, Cl. 355-53.000.
Nakajima, Hisao: *See—*
Landreau, Jean; and Nakajima, Hisao, 5,024,853, Cl. 427-10.000.
Nakajima, Masatoshi: *See—*
Seki, Masaki; Takegahara, Takashi; and Nakajima, Masatoshi, 5,025,363, Cl. 364-191.000.
Nakajima, Nobuyuki, to Diesel Kiki Co., Ltd. Vane compressor having reduced weight as well as excellent anti-seizure and wear resistance. 5,024,591, Cl. 418-178.000.
Nakamura, Akihisa, to Fuji Jukogyo Kabshiki Kaisha. Engine idling control apparatus. 5,024,197, Cl. 123-339.000.
Nakamura, Arao; Manabe, Tsuneo; Sugimoto, Naoki; and Usui, Hiroshi, to Asahi Glass Company, Ltd. Glass having ultrafine particles of CuCl and/or CuBr precipitated therein and process for its production. 5,024,974, Cl. 501-57.000.
Nakamura, Haruhiko: *See—*
Kitamura, Shigeharu; Nakamura, Haruhiko; and Sanada, Masaru, 5,024,314, Cl. 198-333.000.
Nakamura, Hideo: *See—*
Yamamoto, Yohzoh; Suzuki, Goro; Nakamura, Hideo; and Yasuda, Kiyomi, 5,025,067, Cl. 525-109.000.
Nakamura, Hiroaki; and Takagi, Atsushi, to Fuji Photo Film Co., Ltd. Color image forming apparatus. 5,025,282, Cl. 355-38.000.
Nakamura, Katsumi: *See—*
Tanaka, Hiroaki; Enya, Takeshi; and Nakamura, Katsumi, 5,024,101, Cl. 73-766.000.
Nakamura Koki Co., Ltd.: *See—*
Nakamura, Masao, 5,024,250, Cl. 138-31.000.
Nakamura, Kyuzo; Ota, Yoshifumi; and Yamada, Taiki, to Nihon Shinku Gijutsu Kabushiki Kaisha. Method of manufacturing perpendicular type magnetic recording member. 5,024,854, Cl. 427-38.000.
Nakamura, Masao, to Nakamura Koki Co., Ltd. Piston type accumulator for hydraulic system. 5,024,250, Cl. 138-31.000.
Nakamura, Noboru: *See—*
Ushio, Sadakatsu; Nakamura, Noboru; Higashi, Hirofumi; Iwata, Masataka; and Niwa, Fumiyasu, 5,024,189, Cl. 123-195.00R.
Nakanishi, Masahiro; Mori, Daisuke; Fujii, Katsuyoshi; Hatanaka, Masahiko; and Shinada, Hiroko, to Matsushita Electric Industrial Co., Ltd. Electronic musical instrument with improved generation of wind instruments. 5,024,133, Cl. 84-615.000.

Nakanishi, Tetsuya: *See*—
Okuda, Soichiro; Nakanishi, Tetsuya; Sasaki, Shigeo; and Noguchi, Kazuhiko, 5,025,167, Cl. 250-492.200.
Nakanishi, Yuki: *See*—
Tsuchida, Yasuyuki; and Nakanishi, Yuki, 5,023,973, Cl. 15-319.000.
Nakano, Hiroki: *See*—
Yonezawa, Yasuo; Ohnishi, Toshiya; Okumura, Shin-ichi; Sakai, Akiyoshi; Nakano, Hiroki; Matsushita, Masao; Morikawa, Atsushi; and Yoshihara, Motoshi, 5,024,064, Cl. 62-106.000.
Nakano, Hiroshi: *See*—
Ohta, Tomozo; Nakano, Hiroshi; and Miyazaki, Masao, 5,025,261, Cl. 342-357.000.
Nakano, Kinichiro: *See*—
Etoh, Yoshiyuki; Inoue, Hiroshi; Mori, Kazuyuki; Suzuki, Koichi; Nakano, Kinichiro; Nomura, Hiroyuki; Yamamoto, Isao; and Yoshida, Kiyoshi, 5,025,379, Cl. 364-426.040.
Nakano, Shigeru; and Kondou, Yasuhiro, to Matsushita Electric Industrial Co. Ltd. Apparatus for running a car at constant speed. 5,024,284, Cl. 180-179.000.
Nakao, Yasushi: *See*—
Yabuta, Motoshi; Nakao, Yasushi; Sugiura, Shinji; Fukuda, Mitsuhiro; and Miyamoto, Yuzo, 5,025,060, Cl. 524-533.000.
Nakase, Hiromi: *See*—
Taniguchi, Hiroshi; Kubo, Kanji; and Nakase, Hiromi, 5,025,329, Cl. 360-77.160.
Nakashima, Hiroshi. Control apparatus for quad-line stunt kites. 5,024,401, Cl. 244-155.00A.
Nakata, Futoshi: *See*—
Noguchi, Ichiro; and Nakata, Futoshi, 5,024,269, Cl. 165-153.000.
Nakata, Masahiro: *See*—
Iiyama, Kiyotaka; Hayakawa, Kunio; Nakata, Masahiro; Kodera, Kaoru; and Miyazaki, Osamu, 5,024,699, Cl. 106-21.000.
Nakata, Muneo: *See*—
Matuo, Ken-iti; Nakata, Muneo; Hori, Mitukazu; and Tanihara, Isaji, 5,025,238, Cl. 335-128.000.
Nakata, Takashi; Tomizawa, Takashi; Hayashi, Shigeyuki; Ohno, Motoshi; and Horaguchi, Yoichi, to Brother Kogyo Kabushiki Kaisha. Image recording apparatus using photosensitive pressure-sensitive recording medium. 5,025,281, Cl. 355-27.000.
Nakatani, Kaname: *See*—
Yoshida, Takeshi; Nakatani, Kaname; Fukami, Toshiyuki; and Tanaka, Nariaki, 5,024,913, Cl. 430-67.000.
Nakazono, Yutaka: *See*—
Omata, Tetsuo; Senda, Shuji; Tanaka, Tamaki; Kumagai, Eriko; Kajimoto, Chikara; and Nakazono, Yutaka, 5,024,832, Cl. 424-84.000.
Naku, Virgil: *See*—
Abplanalp, Robert H.; and Naku, Virgil, 5,024,592, Cl. 425-112.000.
Nalco Chemical Company: *See*—
Wang, Sophia L.; Meyer, George R.; and Brinkman, Kerry C., 5,024,677, Cl. 44-335.000.
Naruse, Hideaki; Takahashi, Osamu; Ohki, Nobutaka; and Ono, Michio, to Fuji Photo Film Co., Ltd. Method for processing silver halide color photographic materials. 5,024,924, Cl. 430-376.000.
Nash, Stephen E., to Federal-Mogul Corporation. Unitized oil seal and method of making a unitized oil seal. 5,024,364, Cl. 277-35.000.
Naslain, Roger: *See*—
Robinbrosse, Christian; Naslain, Roger; Minet, Jacky; and Langlais, Francis, 5,024,878, Cl. 428-297.000.
Nath, Raymond J.: *See*—
Miller, Phillip E.; Katz, Leonoard R.; Nath, Raymond J.; Blaushild, Ronald M.; Tatch, Michael D.; Kordalski, Frank J.; Wykstra, Donald T.; and Kavalkovich, William M., 5,025,129, Cl. 219-201.000.
Nathaniel Gould Diagnostics, Inc.: *See*—
Gould, Nathaniel; Fontes, Michael; and Thessin, Tyler R., 5,025,476, Cl. 382-2.000.
National Research Development Corporation: *See*—
Jones, Robert L.; and Wilson, Norman H., 5,025,034, Cl. 514-529.000.
National Science Council: *See*—
Chen, Mao-Chieh; Tsui, Bing-Yue; and Tsai, Jiunn-Yann, 5,024,954, Cl. 437-24.000.
National Semiconductor Corporation: *See*—
Freitas, Oscar W., 5,025,179, Cl. 307-455.000.
Natori, Katsuhide; Watanabe, Isao; Katsuyama, Koji; Kawamura, Isao; Yamamoto, Karuhiko; and Nagai, Takeshi, to Fujitsu Limited. Method of cooling a semiconductor device with a cooling unit, using metal sherbet between the device and the cooling unit. 5,024,264, Cl. 165-1.000.
Nattrass, Douglas J. Novel blanket/sheet for a double bed. 5,023,969, Cl. 5-486.000.
Nawa, Mitsuharu: *See*—
Kinoshita, Yoshio; and Nawa, Mitsuharu, 5,024,308, Cl. 192-41.00A.
Naylor, Brenda: *See*—
Naylor, Robert J.; Naylor, Brenda; Renaud, Alain; and Langlois, Michel, 5,025,022, Cl. 514-305.000.
Naylor, Robert J.; Naylor, Brenda; Renaud, Alain; and Langlois, Michel. Method of treating or preventing schizophrenia and/or psychosis using S-N-(1-azabicyclo[2.2.2]oct-3-yl)benzamides and thiobenzamides. 5,025,022, Cl. 514-305.000.
Nåbo, Olle: *See*—
Inge, Claes; Franzen, Peter; Lagerstedt, Torgny; Borgstrom, Leonard; Carlsson, Claes-Goran; Moberg, Hans; and Nåbo, Olle, 5,024,648, Cl. 494-56.000.
NEC Corporation: *See*—
Iwamoto, Shinichi, 5,025,414, Cl. 364-900.000.
Nagura, Riichi, 5,025,318, Cl. 358-213.150.
Needham, Thomas E.; Wright, Jeremy C.; Pearson, Steve; Chilamkurti, Rao; and Kopp, Clinton V., to Baxter International Inc. Drug delivery apparatus and method preventing local and systemic toxicity. 5,024,657, Cl. 604-85.000.
Negas, Taki; and Dominques, Louis P., to Alpha Industries. Ceramic dielectric alloy. 5,024,980, Cl. 501-134.000.
Negele, Michael: *See*—
Schallner, Otto; Negele, Michael; Santel, Hans-Joachim; Lurssen, Klaus; Schmidt, Robert R.; and Krauskopf, Birgit, 5,024,694, Cl. 71-95.000.
Negin, Michael: *See*—
DiLullo, Joseph V.; Schifter, Stephan C.; Negin, Michael; and Paist, Kenneth W., 5,025,253, Cl. 340-825.060.
Negroni, Pierre-Paul: *See*—
Barquet, Henri; Negroni, Pierre-Paul; and Plissonneau, Bernard, 5,024,399, Cl. 244-119.000.
Neishi, Toshie; Kikuchi, Toshihiro; Takiguchi, Takao; Suzuki, Koichi; and Matsumoto, Masakazu, to Canon Kabushiki Kaisha. 5H-dibenzo(A,D) cycloheptanylidene derivative and 5H-dibenzo (A,D) cycloheptenylidene derivative, and electrophotographic photosensitive member using the same. 5,024,912, Cl. 430-59.000.
Nelson, Lorne W.: *See*—
Buchholz, Robert L.; Grald, Eric W.; Nelson, Lorne W.; and Shah, Dipak J., 5,024,265, Cl. 165-22.000.
Nelson, Richard O.: *See*—
Reinicke, Robert H.; Mohtar, Rafic; and Nelson, Richard O., 5,024,418, Cl. 251-129.110.
Nelson, Thomas C., to Storage Technology Corporation. Data stream independent printer. 5,025,398, Cl. 364-519.000.
Nelson, Thomas E., to Soltech, Inc. Water heater construction. 5,024,210, Cl. 126-344.000.
Nemas, Mara: *See*—
Linder, Charles; Perry, Mordechai; Nemas, Mara; and Katraro, Reuven, 5,024,765, Cl. 210-651.000.
Nesburn, Anthony B.; Gorin, Michael; Martinez, Marvin; Kenney, M. Cristina; and Maguen, Ezra, to Cedars-Sinai Medical Center. Method of crosslinking amino acid containing polymers using photoactivatable chemical crosslinkers. 5,024,742, Cl. 204-157.680.
Nestec S. A.: *See*—
Heck, Ernst; and Horisberger, Jean, 5,024,719, Cl. 156-522.000.
Nestec S.A.: *See*—
Rasilewicz, Casimir E., 5,024,849, Cl. 426-656.000.
Neuhaus, Alfred; Ganster, Otto; and Kopp, Richard, to Bayer Aktiengesellschaft. Process for the production of molded polyurethane foams and the molded foams obtained by this process. 5,025,039, Cl. 521-51.000.
New York Institute of Technology: *See*—
Parke, Frederic I., 5,025,394, Cl. 364-518.000.
Newell, J. Mark: *See*—
Scott, Brian L.; Smith, Lloyd A.; Newell, J. Mark; Balentine, Bruce E.; and Lin, Lisan S., 5,025,471, Cl. 381-43.000.
Newkirk, Marc S.; and Weinstein, Jerry G., to Lanxide Technology Company, LP. Self-supporting ceramic structures and methods of making the same. 5,024,794, Cl. 264-57.000.
Newkirk, Marc S.: *See*—
Kennedy, Christopher R.; and Newkirk, Marc S., 5,024,795, Cl. 264-59.000.
Newman, H. Anthony, to Bethlehem Steel Corporation. Method and apparatus for continuous welded rail. 5,024,380, Cl. 238-218.000.
Newman, Ira R.: *See*—
McGilp, Kenneth J.; Affa, Stephen N.; and Newman, Ira R., 5,024,454, Cl. 277-207.00A.
Ng, Yee S., to Eastman Kodak Company. Method and apparatus for grey level recording using multiple addressability. 5,025,322, Cl. 358-298.000.
NGK Insulators, Ltd.: *See*—
Iida, Shinzi; Takeya, Fuminori; and Aoki, Shinya, 5,025,343, Cl. 360-127.000.
Ohshima, Masaaki; Kobayashi, Akira; Atsumi, Senji; and Shimada, Hiromi, 5,024,907, Cl. 429-191.000.
NGK Spark Plug Co., Ltd.: *See*—
Kondo, Kazuo; and Okuyama, Masahiko, 5,024,973, Cl. 501-10.000.
Matsubara, Yoshihiro; and Matsumura, Shuzo, 5,024,534, Cl. 374-144.000.
Nguyen, Duc: *See*—
Girardin, Guy; Morin, Pierre; Nguyen, Duy; Nguyen, Duc; and Brunelle, Louise, 5,024,151, Cl. 100-53.000.
Nguyen, Duy: *See*—
Girardin, Guy; Morin, Pierre; Nguyen, Duy; Nguyen, Duc; and Brunelle, Louise, 5,024,151, Cl. 100-53.000.
Nguyen, Quyen C.: *See*—
Hittner, Herman J.; and Nguyen, Quyen C., 5,024,822, Cl. 423-111.000.
Nguyen, Tien M., to United States of America, Administer, National Aeronautics and Space Administration, The United States of America as represented by the Administrator of the National Aeronautics and Space Administration. Phase ambiguity resolution for offset QPSK modulation systems. 5,025,455, Cl. 375-53.000.
Nicholls, Jeffrey R.: *See*—
Busch, Bruce D.; and Nicholls, Jeffrey R., 5,024,783, Cl. 252-180.000.

Nickens, David G.: *See—*
Hegeman, George D.; and Nickens, David G., 5,024,949, Cl. 435-262.000.
Nielsen, Erik B.: *See—*
Gronwald, Frederik; Andersen, Peter H.; Faarup, Peter; Guddal, Erling; Hansen, Kristian T.; Hansen, Louis B.; and Nielsen, Erik B., 5,025,009, Cl. 514-213.000.
Nies, Norbert: *See—*
Hinzmann, Gerd; Nies, Norbert; and Radewahn, Siegfried, 5,024,811, Cl. 419-66.000.
Nigg, Ernst; and Fuchs, Elmar B., to Konrad Doppelmayr & Sohn Maschinenfabrik Gesellschaft m.b.H. & Co. KG. Cable transport apparatus. 5,024,162, Cl. 104-178.000.
Nigh, Phillip J.: *See—*
Maly, Wojciech P.; and Nigh, Phillip J., 5,025,344, Cl. 361-88.000.
Nihon Chikasui Kaihatsu Kabushiki Kaisha: *See—*
Katsuragi, Kohei, 5,024,553, Cl. 404-71.000.
Nihon Shinku Gijutsu Kabushiki Kaisha: *See—*
Nakamura, Kyuzo; Ota, Yoshifumi; and Yamada, Taiki, 5,024,854, Cl. 427-38.000.
Nikaido, Katsutomo: *See—*
Kawakami, Shin; Nikaido, Katsutomo; and Ichikawa, Junichi, 5,025,116, Cl. 174-250.000.
Nikolayczik, Hans: *See—*
Bergmann, Konrad; Ems, Josef; and Nikolayczik, Hans, 5,024,378, Cl. 236-93.00B.
Nikon Corporation: *See—*
Matsubara, Takashi, 5,025,278, Cl. 354-246.000.
Nippon Antenna Co., Ltd.: *See—*
Okamoto, Kengo; Habu, Takaaki; and Muroi, Shoji, 5,025,263, Cl. 343-715.000.
Nippon Carbon Co., Ltd.: *See—*
Ichikawa, Hiroshi, 5,025,243, Cl. 338-18.000.
Nippon CMK Corp.: *See—*
Kawakami, Shin; Nikaido, Katsutomo; and Ichikawa, Junichi, 5,025,116, Cl. 174-250.000.
Nippon Oil and Fats Co., Ltd.: *See—*
Ishidoya, Masahiro; Soma, Toru; and Ogawa, Hisao, 5,025,061, Cl. 524-539.000.
Shimizu, Shoichi; and Yamane, Tsuneo, 5,024,942, Cl. 435-134.000.
Nippon Soken, Inc.: *See—*
Tanaka, Hiroaki; Enya, Takeshi; and Nakamura, Katsumi, 5,024,101, Cl. 73-766.000.
Nippon Telegraph & Telephone Corporation: *See—*
Sudo, Shoichi; Sakai, Yoshihisa; Yasaka, Hiroshi; Ikegami, Tetsuhiko; Yoshikuni, Yuzo; Yokohama, Itaru; and Kubodera, Kenichi, 5,025,448, Cl. 372-32.000.
Nippon Unicar Company Limited: *See—*
Yoshida, Mamoru; Suya, Hachiro; Hayashi, Shoji; Koshiyama, Takao; Hashimoto, Satoshi; and Horita, Katsuhiro, 5,025,042, Cl. 523-216.000.
Nippondenso Co., Ltd.: *See—*
Tanaka, Hiroaki; Enya, Takeshi; and Nakamura, Katsumi, 5,024,101, Cl. 73-766.000.
Nishi, Yuji: *See—*
Koguchi, Tatsushi; Ito, Shigehiro; Ebihara, Kazyuki; and Nishi, Yuji, 5,025,317, Cl. 358-167.000.
Nishida, Minoru: *See—*
Kaneko, Katsuhiko; and Nishida, Minoru, 5,024,388, Cl. 241-301.000.
Nishide, Kenji: *See—*
Taya, Hiroyuki; Yoshinuma, Mikio; Yamada, Takeshi; Nishide, Kenji; Suzuki, Fumio; Fujimoto, Hirohisa; and Yamauchi, Ryozo, 5,024,501, Cl. 350-96.150.
Nishii, Michiharu; Mizuno, Genji; Nomura, Yoshihisa; and Kato, Masahiko, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Hydraulic braking system for an automotive vehicle. 5,024,492, Cl. 303-114.000.
Nishijima, Tamotsu: *See—*
Ohashi, Yasusuke; Fujino, Toshihiro; Taki, Yasuhito; and Nishijima, Tamotsu, 5,024,815, Cl. 420-487.000.
Nishijima, Toyoki: *See—*
Tanji, Masaki; and Nishijima, Toyoki, 5,024,932, Cl. 430-567.000.
Nishikawa, Kohei: *See—*
Nomura, Hiroaki; Nishikawa, Kohei; Tsushima, Susumu; and Kozai, Yoshio, 5,025,005, Cl. 514-183.000.
Nishikawa, Masahiko: *See—*
Kurisaki, Hideo; and Nishikawa, Masahiko, 5,024,831, Cl. 424-69.000.
Nishikawa, Masumi, to Aisin Seiki Kabushiki Kaisha. Shock detecting device. 5,024,157, Cl. 102-252.000.
Nishimatsu Co., Ltd.: *See—*
Kaneko, Katsuhiko; and Nishida, Minoru, 5,024,388, Cl. 241-301.000.
Nishimiya, Takeshi, to Fujitsu Limited. Head positioning control system and method for a memory device using even and odd track cross pulses. 5,025,330, Cl. 360-78.040.
Nishimura, Dwight G.: *See—*
Pauly, John M.; and Nishimura, Dwight G., 5,025,216, Cl. 324-309.000.
Nishimura, Takashi: *See—*
Miyata, Yukitaka; Wada, Hiroyuki; and Nishimura, Takashi, 5,025,166, Cl. 250-492.100.
Nishino, Yoichi, to Sony Corporation. Input/output circuit. 5,025,419, Cl. 365-221.000.
Nishioka, Jim Z. Trigger cover. 5,024,017, Cl. 42-70.070.
Nishioka, Yasuyuki; and Hirano, Akihiro, to Horiba, Ltd. Sample analyzer. 5,024,108, Cl. 73-863.110.
Nishiyama, Katsuhiro. Magnesium-titanium type alloy and method for producing the same. 5,024,813, Cl. 420-402.000.
Nishiyodo Air Conditioner Co., Ltd.: *See—*
Yonezawa, Yasuo; Ohnishi, Toshiya; Okumura, Shin-ichi; Sakai, Akiyoshi; Nakano, Hiroki; Matsushita, Masao; Morikawa, Atsushi; and Yoshihara, Motoshi, 5,024,064, Cl. 62-106.000.
Nishizawa, Masahiro: *See—*
Morishita, Hajime; Hayashi, Nobuaki; Nonogaki, Saburo; Hashimoto, Michiaki; Ito, Masato; Nishizawa, Masahiro; Miura, Kiyoshi; and Odaka, Yoshiyuki, 5,024,920, Cl. 430-325.000.
Nishizawa, Tsutomu: *See—*
Itoh, Hisato; Enomoto, Katashi; Oguchi, Takahisa; and Nishizawa, Tsutomu, 5,024,926, Cl. 430-495.000.
Nishizuka, Hiroshi: *See—*
Komoriya, Susumu; Nishizuka, Hiroshi; Nakagawa, Shinya; and Maejima, Hisashi, 5,025,284, Cl. 355-53.000.
Nissan Chemical Industries Ltd.: *See—*
Fujikawa, Yoshihiro; Suzuki, Mikio; Iwasaki, Hiroshi; Sakashita, Mitsuaki; and Kirahara, Masaki, 5,024,999, Cl. 514-63.000.
Nissan Motor Company, Limited: *See—*
Etoh, Yoshiyuki; Inoue, Hiroshi; Mori, Kazuyuki; Suzuki, Koichi; Nakano, Kinichiro; Nomura, Hiroyuki; Yamamoto, Isao; and Yoshida, Kiyoshi, 5,025,379, Cl. 364-426.040.
Naito, Tatsuo, 5,025,393, Cl. 364-513.000.
Sasaki, Michiaki; and Yuki, Kazuya, 5,024,583, Cl. 417-198.000.
Takemura, Toji; and Okubo, Takashi, 5,024,309, Cl. 192-60.000.
Nissan Motor Company, Ltd. of No. 2: *See—*
Shinzawa, Motohiro; and Sekiya, Yoshiki, 5,024,194, Cl. 123-269.000.
Nisshin Flour Milling Co., Ltd.: *See—*
Miura, Katsutoshi; Koyama, Hiroyasu; Sugai, Toshiji; Yamada, Hiroaki; and Sakurai, Einosuke, 5,025,012, Cl. 514-252.000.
Nitecki, Danute E.: *See—*
Houston, L. L.; Aldwin, Lois; and Nitecki, Danute E., 5,024,834, Cl. 424-85.910.
Nitto Denko Co. Ltd.: *See—*
Omata, Tetsuo; Senda, Shuji; Tanaka, Tamaki; Kumagai, Eriko; Kajimoto, Chikara; and Nakazono, Yutaka, 5,024,832, Cl. 424-84.000.
Niwa, Fumiyasu: *See—*
Ushio, Sadakatsu; Nakamura, Noboru; Higashi, Hirofumi; Iwata, Masataka; and Niwa, Fumiyasu, 5,024,189, Cl. 123-195.00R.
NKK Corporation: *See—*
Kuruma, Kiyoshi; Abe, Masaki; Kagechika, Hiroshi; and Kagaya, Shinichi, 5,024,900, Cl. 428-626.000.
NLB Corp.: *See—*
Shook, Forrest A.; and Henshaw, Terry L., 5,024,382, Cl. 239-11.000.
Noble, Jerry D. Electronic force ionized gas air conditioning system compressor. 5,024,059, Cl. 62-3.100.
Noblet, James A.: *See—*
Sheaffer, Patrick M.; and Noblet, James A., 5,024,710, Cl. 156-89.000.
Nobuta, Yasuo: *See—*
Saito, Yasuo; Fujimoto, Seiji; Nobuta, Yasuo; and Yamazaki, Masahiko, 5,025,462, Cl. 378-19.000.
Noguchi, Ichiro; and Nakata, Futoshi, to Zexel Corporation. Laminated heat exchanger. 5,024,269, Cl. 165-153.000.
Noguchi, Kazuhiko: *See—*
Okuda, Soichiro; Nakanishi, Tetsuya; Sasaki, Shigeo; and Noguchi, Kazuhiko, 5,025,167, Cl. 250-492.200.
Noguchi, Seiji: *See—*
Futatasuka, Rensei; Koshiba, Yutaka; Chiba, Shunich; Orikasa, Toyoaki; Noguchi, Seiji; and Idoshita, Takuya, 5,024,814, Cl. 420-473.000.
Nomori, Hiroyuki: *See—*
Haneda, Satoshi; and Nomori, Hiroyuki, 5,025,272, Cl. 346-153.100.
Nomura, Hiroaki; Nishikawa, Kohei; Tsushima, Susumu; and Kozai, Yoshio, to Takeda Chemical Industries, Ltd. Lipid derivatives, their production and use. 5,025,005, Cl. 514-183.000.
Nomura, Hiroyuki: *See—*
Etoh, Yoshiyuki; Inoue, Hiroshi; Mori, Kazuyuki; Suzuki, Koichi; Nakano, Kinichiro; Nomura, Hiroyuki; Yamamoto, Isao; and Yoshida, Kiyoshi, 5,025,379, Cl. 364-426.040.
Nomura, Ichiro: *See—*
Suzuki, Hidetoshi; Nomura, Ichiro; Majima, Toshiaki; and Yamamoto, Mitsuru, 5,025,196, Cl. 315-168.000.
Nomura, Yoshihisa: *See—*
Nishii, Michiharu; Mizuno, Genji; Nomura, Yoshihisa; and Kato, Masahiko, 5,024,492, Cl. 303-114.000.
Nonogaki, Saburo: *See—*
Morishita, Hajime; Hayashi, Nobuaki; Nonogaki, Saburo; Hashimoto, Michiaki; Ito, Masato; Nishizawa, Masahiro; Miura, Kiyoshi; and Odaka, Yoshiyuki, 5,024,920, Cl. 430-325.000.
Nonoyama, Hiroshi: *See—*
Yoshiga, Norio; Kawamura, Masahiro; and Nonoyama, Hiroshi, 5,024,891, Cl. 428-414.000.
Norling, Brian L., to Sundstrand Data Control, Inc. Stress compensated transducer. 5,024,089, Cl. 73-517.00B.
Norman, Neville M. Indicating means for tetherball game. 5,024,446, Cl. 273-413.000.
Norsolor: *See—*
Paumard, Eric; Mutez, Sylvain; Mortreux, Andre; and Petit, Francis, 5,024,983, Cl. 502-167.000.

North American Philips Corporation: *See*—
Darby, Ted A., 5,025,316, Cl. 358-167.000.
North East Form Engineering, Inc.: *See*—
Randall, Joseph G., 5,024,563, Cl. 408-1.00R.
Northern Telecom Limited: *See*—
Marks, Robert J., 5,025,345, Cl. 361-119.000.
Reisman, Arnold; and Turlik, Iwona, 5,025,304, Cl. 357-71.000.
Winkelstein, Dan, 5,025,402, Cl. 364-578.000.
Norton Company: *See*—
Chen, Sy-Hwa; and Sung, Chien-Min, 5,024,680, Cl. 51-295.000.
Nose, Toshiro; Hashimoto, Hisashi; and Manda, Masato, to Hitachi, Ltd. Data processing system capable of executing data processing using resources by designating displayed graphic patterns representing selected resources. 5,025,395, Cl. 364-518.000.
Noujaim, Sharbel E.: *See*—
Hartley, Richard I.; Corbett, Peter F.; Yassa, Fathy F.; and Noujaim, Sharbel E., 5,025,257, Cl. 341-101.000.
Nouvertne, Werner: *See*—
Tacke, Peter; Grigo, Ulrich; Nouvertne, Werner; Freitag, Dieter; Idel, Karsten-Josef; and Westeppe, Uwe, 5,025,065, Cl. 524-611.000.
Novo Nordisk A/S: *See*—
Gronwald, Frederik; Andersen, Peter H.; Faarup, Peter; Guddal, Erling; Hansen, Kristian T.; Hansen, Louis B.; and Nielsen, Erik B., 5,025,009, Cl. 514-213.000.
Nowack, Gerhard P.: *See*—
Tooley, Patricia A.; Cheung, Tin-Tack P.; Cymbaluk, Ted H.; Nowack, Gerhard P.; and Johnson, Marvin M., 5,024,683, Cl. 55-74.000.
Nowak, William J.; Attardi, Anthony A.; and Costanza, Daniel W., to Zerox Corporation. Edge effect compensation in high frequency vibratory energy producing devices for electrophotographic imaging. 5,025,291, Cl. 355-273.000.
Nowlin, Thomas E.; and Wagner, Klaus P., to Mobil Oil Corporation. Highly active catalyst composition for polymerizing alpha-olefins. 5,025,072, Cl. 526-129.000.
Nozaki, Chikateru; Miyanohara, Atsushi; Hamada, Fukusaburo; Ohtomo, Nobuya; and Matsubara, Kenichi, to Juridical Foundation The Chemo-Sero-Therapeutic Research Institute. Recombinant DNA inserted with hepatitis B virus gene, mammalian cells transformed with cloned viral DNA, and production of hepatitis B virus proteins. 5,024,938, Cl. 435-68.100.
Nozawa, Eiji: *See*—
Miura, Masao; Uchida, Naoshi; Takahashi, Tatsunori; Asakawa, Kouji; and Nozawa, Eiji, 5,025,236, Cl. 335-46.000.
NSK Warner K.K.: *See*—
Kinoshita, Yoshio; and Nawa, Mitsuharu, 5,024,308, Cl. 192-41.00A.
Nukada, Katsumi: *See*—
Akasaki, Yutaka; Aonuma, Hidekazu; Nukada, Katsumi; Tokita, Akihiko; Suto, Hidemi; Sato, Katsuhiro; and Tanaka, Hiroyuki, 5,024,911, Cl. 430-58.000.
Numata, Ken-ichi: *See*—
Konishi, Masataka; Tomita, Koji; Oka, Masahisa; and Numata, Ken-ichi, 5,025,023, Cl. 514-183.000.
Numazawa, Kenichi: *See*—
Arai, Kei; Ohashi, Minoru; Utsugi, Yoshio; Oka, Osamu; Numazawa, Kenichi; Miwa, Kenji; and Sugawara, Kenzo, 5,024,816, Cl. 422-68.100.
Nunally, Patrick O., to General Dynamics Corp., Pomona Div. Fault-resistant solid-state line driver. 5,025,178, Cl. 307-442.000.
Nyman, Mikko: *See*—
Laine, Juhani; Nyman, Mikko; and Paananen, Tapio, 5,024,263, Cl. 165-1.000.
O-I Neg TV Products, Inc.: *See*—
Ward, William R., 5,024,315, Cl. 198-341.000.
Obata, Shuichi: *See*—
Tanaka, Tsuneo; Sato, Kazue; Takewa, Hiroyuki; Kurozuka, Akira; Tamura, Tadashi; Hattori, Katsuji; Takayama, Satoshi; Murata, Kosaku; Satoh, Katsuaki; Serikawa, Mituhiko; Kimura, Youichi; and Obata, Shuichi, 5,025,474, Cl. 381-90.000.
Obligin, Alan: *See*—
Smid, Johannes; Cabasso, Israel; Obligin, Alan; and Rawls, H. Ralph, 5,024,232, Cl. 128-654.000.
Occupant Safety Systems, Inc.: *See*—
Zygutis, James L.; and Doty, Gerald A., 5,024,391, Cl. 242-107.200.
OCG Microelectronic Materials, Inc.: *See*—
Blakeney, Andrew J.; Jeffries, Alfred T., III; and Sarubbi, Thomas R., 5,024,921, Cl. 430-326.000.
Ochiai, Kiyoshi, to Sumitomo Rubber Industries, Ltd. Radial tire for heavy duty vehicles. 5,024,260, Cl. 152-209.00R.
Ochsner, Richard, to Coflexip. Hoses stable in length under the effect of an internal pressure. 5,024,252, Cl. 138-130.000.
Oda, Kazuya: *See*—
Mutoh, Hideki; Oda, Kazuya; and Kawajiri, Kazuhiro, 5,025,319, Cl. 358-213.290.
Oda, Masao: *See*—
Kobayashi, Toshiyuki; Koshinaka, Masao; Kinoshita, Yoshimi; Oda, Masao; and Yoshizawa, Kenji, 5,024,182, Cl. 118-723.000.
Oda, Toshikazu: *See*—
Yamazaki, Syoji; Oda, Toshikazu; Iwanaga, Kenji; and Gono, Yoshitaka, 5,025,237, Cl. 335-83.000.
Odagaki, Toru, to Ushio Denki Kabushiki Kaisha. Elongate tubular incandescent lamp with filament shorting bars. 5,025,188, Cl. 313-273.000.
Odaka, Yoshiyuki: *See*—
Morishita, Hajime; Hayashi, Nobuaki; Nonogaki, Saburo; Hashimoto, Michiaki; Ito, Masato; Nishizawa, Masahiro; Miura, Kiyoshi; and Odaka, Yoshiyuki, 5,024,920, Cl. 430-325.000.
Odom, Robert W.; and Strathman, Michael D. Resistive anode encoder target and method producing baths charged and visual images. 5,025,144, Cl. 250-207.000.
Oekonomopulos, Raymond; Henning, Rainer; Lerch, Ulrich; Scholkens, Bernward; and Linz, Wolfgang, to Hoechst Aktiengesellschaft. Benzothiazinone derivatives, and pharmaceuticals containing them. 5,025,010, Cl. 514-224.200.
Office National d'Etudes et de Recherche Aerospatiales (ONERA): *See*—
Maisonneuve, Jean-Michel; Domergue, Jean-Paul; Parize, Gabrielle; Palandjian, Philippe; and Isbert, Jacques, 5,024,502, Cl. 350-96.160.
Oftring, Alfred; Birnbach, Stefan; Fikentscher, Rolf; Baur, Richard; Kud, Alexander; Goeckel, Ulrich; and Perner, Johannes, to BASF Aktiengesellschaft. Glycerol aminocarboxylates and preparation and use thereof. 5,025,103, Cl. 560-170.000.
Ogawa, Hisao: *See*—
Ishidoya, Masahiro; Soma, Toru; and Ogawa, Hisao, 5,025,061, Cl. 524-539.000.
Ogawa, Masanobu: *See*—
Arakawa, Masao; Terasawa, Tomizo; Ogawa, Masanobu; and Kami, Hironori, 5,025,169, Cl. 250-574.000.
Ogawa, Yasushi: *See*—
Chu, George H.; Ogawa, Yasushi; McPherson, John M.; Ksander, George; Pratt, Bruce; Hendricks, Diana; and McMullin, Hugh, 5,024,841, Cl. 424-422.000.
Ogle, George Braddock, II, to International Medication Systems, Limited. Disposable sheath for hypodermic cannula used with a syringe. 5,024,616, Cl. 604-192.000.
Oguchi, Takahisa: *See*—
Itoh, Hisato; Enomoto, Katashi; Oguchi, Takahisa; and Nishizawa, Tsutomu, 5,024,926, Cl. 430-495.000.
Oguchi, Yuzo: *See*—
Komatsu, Fumito; Usuki, Hideo; and Oguchi, Yuzo, 5,024,088, Cl. 73-517.00B.
Ogura, Tsugitoshi: *See*—
Moriyama, Noboru; Ogura, Tsugitoshi; and Hiraki, Akio, 5,024,676, Cl. 44-301.000.
Ohashi, Hiroshi: *See*—
Tanaka, Masaki; Ohashi, Hiroshi; and Takahashi, Yoshinobu, 5,025,076, Cl. 528-33.000.
Ohashi, Kaoru: *See*—
Kokubo, Kouichi; Hamada, Toshiaki; Tagawa, Shinichi; Suzumura, Nobuyasu; Buma, Shuuichi; Aburaya, Toshio; Onuma, Toshio; Sato, Kunihito; Yonekawa, Takashi; Kawanishi, Masaki; Ikemoto, Hiroyuki; and Ohashi, Kaoru, 5,024,459, Cl. 280-707.000.
Ohashi, Minoru: *See*—
Arai, Kei; Ohashi, Minoru; Utsugi, Yoshio; Oka, Osamu; Numazawa, Kenichi; Miwa, Kenji; and Sugawara, Kenzo, 5,024,816, Cl. 422-68.100.
Ohashi, Tsuyoshi, to Brother Kogyo Kabushiki Kaisha. Drive circuit and method for setting a control signal of a semiconductor laser. 5,025,447, Cl. 372-31.000.
Ohashi, Yasusuke; Fujino, Toshihiro; Taki, Yasuhito; and Nishijima, Tamotsu, to Yazaki Corporation. Copper alloy with phosphorus and iron. 5,024,815, Cl. 420-487.000.
Ohgoda, Makoto, to Fuji Photo Film Co., Ltd. Radiation image read-out apparatus. 5,025,156, Cl. 250-327.200.
Ohie, Takayuki: *See*—
Tateishi, Kiyoshi; Sakata, Haruyasu; Tawaragi, Yuji; Suzuki, Masanori; and Ohie, Takayuki, 5,025,434, Cl. 369-44.360.
Ohira, Tadashi: *See*—
Shimizu, Tadafumi; and Ohira, Tadashi, 5,024,431, Cl. 271-263.000.
Ohki, Nobutaka: *See*—
Naruse, Hideaki; Takahashi, Osamu; Ohki, Nobutaka; and Ono, Michio, 5,024,924, Cl. 430-376.000.
Ohkubo, Satoru; and Washino, Shoichi, to Mitsubishi Denki Kabushiki Kaisha. Engine-start discriminating apparatus for an internal combustion engine. 5,024,082, Cl. 73-117.300.
Ohkura, Hirokazu: *See*—
Katsura, Toru; Kaji, Hiroo; Hyodo, Kenji; and Ohkura, Hirokazu, 5,024,986, Cl. 503-200.000.
Ohler, Craig A.: *See*—
Anthony, Michael; Ohler, Craig A.; and Christensen, Arnold, 5,024,132, Cl. 84-312.00R.
Ohmori, Naoto: *See*—
Hasegawa, Hirofumi; Ohmori, Naoto; Yamada, Yukio; and Yoshida, Narutaka, 5,025,286, Cl. 355-244.000.
Ohnishi, Toshiya: *See*—
Yonezawa, Yasuo; Ohnishi, Toshiya; Okumura, Shin-ichi; Sakai, Akiyoshi; Nakano, Hiroki; Matsushita, Masao; Morikawa, Atsushi; and Yoshihara, Motoshi, 5,024,064, Cl. 62-106.000.
Ohno, Motoshi: *See*—
Nakata, Takashi; Tomizawa, Takashi; Hayashi, Shigeyuki; Ohno, Motoshi; and Horaguchi, Yoichi, 5,025,281, Cl. 355-27.000.
Ohsawa, Katsuyuki: *See*—
Nagano, Susumu; Kawazoe, Hiromitsu; and Ohsawa, Katsuyuki, 5,024,184, Cl. 123-48.00R.
Ohsawa, Yutaka: *See*—
Kitazawa, Toshiyuki; Kurosaki, Masahiko; and Ohsawa, Yutaka, 5,025,276, Cl. 354-152.000.

Ohshima, Masaaki; Kobayashi, Akira; Atsumi, Senji; and Shimada, Hiromi, to Tokyo Electric Co., The; and NGK Insulators, Ltd. Solid electrolyte tube for sodium sulfur cells and surface finishing process thereof. 5,024,907, Cl. 429-191.000.
Ohta, Atsuo: *See—*
Ito, Toshifumi; Ohta, Atsuo; and Yamashita, Shoji, 5,024,113, Cl. 74-6.000.
Ohta, Takeo; Uchida, Masami; Kotera, Koichi; and Matsubara, Kunihiro, to Matsushita Electric Industrial Co., Ltd. Optical information recording medium. 5,024,910, Cl. 430-19.000.
Ohta, Tomozo; Nakano, Hiroshi; and Miyazaki, Masao, to Sharp Kabushiki Kaisha. Mobile object navigation system. 5,025,261, Cl. 342-357.000.
Ohtani, Hichiro: *See—*
Inada, Masanori; and Ohtani, Hichiro, 5,024,083, Cl. 73-204.260.
Ohtomo, Nobuya: *See—*
Nozaki, Chikateru; Miyanohara, Atsushi; Hamada, Fukusaburo; Ohtomo, Nobuya; and Matsubara, Kenichi, 5,024,938, Cl. 435-68.100.
Ohtsuka, Nobuaki: *See—*
Miyamoto, Junichi; Ohtsuka, Nobuaki; Yoshikawa, Kuniyoshi; and Mori, Seiichi, 5,025,417, Cl. 365-189.090.
Ohtsuki, Toshinori: *See—*
Saeki, Kiyoshi; Ohtsuki, Toshinori; and Ueno, Kazuo, 5,025,269, Cl. 346-108.000.
Ohuchi, Hirofumi, to Mitsubishi Denki Kabushiki Kaisha. Idle speed adjusting system for internal combustion engine. 5,024,196, Cl. 123-339.000.
Ohuchi, Satoshi, to Ricoh Company, Ltd. Dot region discriminating method. 5,025,481, Cl. 382-53.000.
Oikawa, Tomohiro, to Ricoh Company, Ltd. Polygonal mirror for scanning light beam. 5,024,496, Cl. 350-6.800.
Oka, Masahisa: *See—*
Konishi, Masataka; Tomita, Koji; Oka, Masahisa; and Numata, Ken-ichi, 5,025,023, Cl. 514-183.000.
Oka, Osamu: *See—*
Arai, Kei; Ohashi, Minoru; Utsugi, Yoshio; Oka, Osamu; Numazawa, Kenichi; Miwa, Kenji; and Sugawara, Kenzo, 5,024,816, Cl. 422-68.100.
Okabayashi, Norio, to Daicel Chemical Industries, Ltd. Stamper cleaning apparatus. 5,024,744, Cl. 204-194.000.
Okabe, Yoshie, to Kabushiki Kaisha Toshiba. Processing machine. 5,025,475, Cl. 382-1.000.
Okada, Hisao: *See—*
Kubota, Jun; Kino, Hirotoshi; Musha, Yosinori; and Okada, Hisao, 5,024,094, Cl. 73-634.000.
Sasaki, Souji; Kino, Hirotoshi; Musha, Yoshinori; Kubota, Jun; and Okada, Hisao, 5,024,093, Cl. 73-633.000.
Okada, Kazuo, to Kabushiki Kaisha Universal. Slot machine. 5,024,439, Cl. 273-143.00R.
Okada, Kazuo: *See—*
Takokoro, Michihiro; Okada, Kazuo; and Imai, Hitoshi, 5,025,430, Cl. 369-13.000.
Okada, Shoji: *See—*
Fujie, Naofumi; Imaizumi, Tomoaki; Ito, Koji; and Okada, Shoji, 5,025,187, Cl. 310-323.000.
Okada, Takao; Yagi, Akira; Morita, Seizo; and Mikoshiba, Nobuo, to Olympus Optical Co., Ltd. Scanning tunneling spectroscope and a spectroscopic information detection method. 5,025,153, Cl. 250-306.000.
Okamoto, Kengo; Habu, Takaaki; and Muroi, Shoji, to Nippon Antenna Co., Ltd. Multi-frequency antenna. 5,025,263, Cl. 343-715.000.
Okamoto, Manabu, to Ushio denki Kabushiki Kaisha. End base construction for a discharge lamp. 5,025,192, Cl. 313-623.000.
Okamuro, Tomio: *See—*
Kawaguchi, Masaaki; Okamuro, Tomio; and Shirose, Keiichi, 5,024,464, Cl. 280-731.000.
O'Keefe, Sheila: *See—*
Mydill, Marc R.; Pile, Sam R.; O'Keefe, Sheila; Okerblom, Neal F.; and Keenan, W. Russ, 5,025,205, Cl. 324-73.100.
Okerblom, Neal F.: *See—*
Mydill, Marc R.; Pile, Sam R.; O'Keefe, Sheila; Okerblom, Neal F.; and Keenan, W. Russ, 5,025,205, Cl. 324-73.100.
Oki Electric Industry Co., Ltd.: *See—*
Shikata, Makoto, 5,025,174, Cl. 307-272.200.
Yamauchi, Takahiro, 5,024,919, Cl. 430-312.000.
Okita, Tsutomu: *See—*
Watanabe, Hideomi; and Okita, Tsutomu, 5,024,892, Cl. 428-423.100.
Oklahoma Medical Research Foundation: *See—*
Carney, John M.; and Floyd, Robert A., 5,025,032, Cl. 514-400.000.
Oksuz, Martha: *See—*
Woestemeyer, Henry J.; and Oksuz, Martha, 5,024,487, Cl. 299-2.000.
Okubo, Takashi: *See—*
Takemura, Toji; and Okubo, Takashi, 5,024,309, Cl. 192-60.000.
Okuda, Soichiro; Nakanishi, Tetsuya; Sasaki, Shigeo; and Noguchi, Kazuhiko, to Mitsubishi Denki Kabushiki Kaisha. Ion implantation apparatus. 5,025,167, Cl. 250-492.200.
Okui, Kaoru; and Kobayashi, Manabu, to Yamaha Hatsudiki Kabushiki Kaisha. Engine unit for vehicle. 5,024,287, Cl. 180-297.000.
Okumura, Shin-ichi: *See—*
Yonezawa, Yasuo; Ohnishi, Toshiya; Okumura, Shin-ichi; Sakai, Akiyoshi; Nakano, Hiroki; Matsushita, Masao; Morikawa, Atsushi; and Yoshihara, Motoshi, 5,024,064, Cl. 62-106.000.
Okuno, Akira: *See—*
Ishimura, Toshihiko; Okuno, Akira; Tanii, Junichi; and Seki, Reiji, 5,025,239, Cl. 335-265.000.
Okuyama, Masahiko: *See—*
Kondo, Kazuo; and Okuyama, Masahiko, 5,024,973, Cl. 501-10.000.
Oldham, James G.; Spencer, Charles R.; Begley, Carl L.; and Meyer, H. Robert, to MK-Ferguson Company; and Chem-Nuclear Systems Inc. Site survey method and apparatus. 5,025,150, Cl. 250-253.000.
Olemunda Pty. Ltd.: *See—*
Spencer, Dennis S., 5,024,217, Cl. 128-82.000.
Olges, Wolfgang: *See—*
Anderheggen, Wolfgang; Kraemer, Michael; Vogelsgesang, Roland; Wagner, Wolfram; Olges, Wolfgang; and Dragovic, Thomas, 5,024,797, Cl. 264-143.000.
Olin Corporation: *See—*
Braden, Jeffrey S., 5,025,114, Cl. 174-52.400.
SinghDeo, Narendra N.; Mahulikar, Deepak; and Butt, Sheldon H., 5,024,883, Cl. 428-323.000.
Olive, Clive E., to Rolls-Royce plc. Control of variable stator vanes. 5,024,580, Cl. 415-150.000.
Oliver, David: *See—*
Harbarger, Josephine A.; Oliver, David; and Anthony, Ella L., 5,024,207, Cl. 125-35.000.
Oliver, James L.; Juriga, James A.; Walton, Erlen B.; and Preston, David M., to Eaton Corporation. Manually power mechanical actuator for parallel auxiliary spring. 5,024,463, Cl. 280-718.000.
Olson, David A.: *See—*
Free, Paul D.; Doszpoly, B.; Villanyi, Tibor J.; and Olson, David A., 5,024,200, Cl. 123-501.000.
Olson, Jeffrey A., to Outboard Marine Corporation. Internal combustion engine fuel supply system. 5,024,385, Cl. 239-410.000.
Olti, Avraham: *See—*
Blumberg, Shlomo; and Olti, Avraham, 5,025,426, Cl. 368-10.000.
Olympus Optical Co., Ltd.: *See—*
Inoue, Takashi; Suzuki, Tatsuya; Kimura, Akiteru; Miyazaki, Hiroaki; and Katagiri, Moriya, 5,025,277, Cl. 354-173.100.
Inoue, Takashi; Suzuki, Tatsuya; Kimura, Akiteru; Miyazaki, Hiroaki; and Katagiri, Moriya, 5,025,277, Cl. 354-173.100.
Okada, Takao; Yagi, Akira; Morita, Seizo; and Mikoshiba, Nobuo, 5,025,153, Cl. 250-306.000.
Watanabe, Masaki, 5,024,024, Cl. 51-124.00L.
Omata, Tetsuo; Senda, Shuji; Tanaka, Tamaki; Kumagai, Eriko; Kajimoto, Chikara; and Nakazono, Yutaka, to Nitto Denko Co. Ltd. Termites trail-following pheromone and a same composition and method of detecting captured termites by using this composition. 5,024,832, Cl. 424-84.000.
Omori, Hideharu: *See—*
Kamigaki, Masaharu; Oshikata, Hironobu; Kawata, Yoshihiro; Shiga, Nobuyasu; Omori, Hideharu; Kawashima, Masayuki; and Shimatani, Toshimichi, 5,025,441, Cl. 370-77.000.
Omori, Hideki: *See—*
Kihara, Hiroyuki; and Omori, Hideki, 5,024,025, Cl. 51-165.770.
Omotezako, Nobuya: *See—*
Sone, Toshiyuki; Matsumoto, Takehiko; Omotezako, Nobuya; and Kawasuji, Keiji, 5,025,338, Cl. 360-99.060.
Omron Tateisi Electronics Co.: *See—*
Matuo, Ken-iti; Nakata, Muneo; Hori, Mitukazu; and Tanihara, Isaji, 5,025,238, Cl. 335-128.000.
Ono, Michio: *See—*
Naruse, Hideaki; Takahashi, Osamu; Ohki, Nobutaka; and Ono, Michio, 5,024,924, Cl. 430-376.000.
Ono, Tatsuo. Process for connection of supports, and support system. 5,024,037, Cl. 52-646.000.
Onuma, Toshio: *See—*
Kokubo, Kouichi; Hamada, Toshiaki; Tagawa, Shinichi; Suzumura, Nobuyasu; Buma, Shuuichi; Aburaya, Toshio; Onuma, Toshio; Sato, Kunihito; Yonekawa, Takashi; Kawanishi, Masaki; Ikemoto, Hiroyuki; and Ohashi, Kaoru, 5,024,459, Cl. 280-707.000.
Oohashi, Keiji; Araki, Shinji; Suzuki, Hideo; and Shimomichi, Tsuyoshi, to Fujikura Ltd. Method for producing carbon-coated optical fiber. 5,024,688, Cl. 65-3.120.
Optical Communications Corp.: *See—*
Lill, Thomas M., 5,025,459, Cl. 375-117.000.
Orbital Engine Company Proprietary Limited: *See—*
McKay, Michael L., 5,024,202, Cl. 123-533.000.
Orega Electronique et Mecanique: *See—*
Bouillot, Jean-Michel; Coutureau, Thierry; and Decuyper, Patrick G., 5,025,241, Cl. 336-100.000.
Oriental Electric Company, Ltd.: *See—*
Arai, Kei; Ohashi, Minoru; Utsugi, Yoshio; Oka, Osamu; Numazawa, Kenichi; Miwa, Kenji; and Sugawara, Kenzo, 5,024,816, Cl. 422-68.100.
Orikasa, Toyoaki: *See—*
Futatasuka, Rensei; Koshiba, Yutaka; Chiba, Shunich; Orikasa, Toyoaki; Noguchi, Seiji; and Idoshita, Takuya, 5,024,814, Cl. 420-473.000.
Orth, Jeffrey L.: *See—*
Peters, Jeffrey L.; and Orth, Jeffrey L., 5,024,668, Cl. 606-194.000.
Osabe, Akio: *See—*
Watanabe, Toshio; Sato, Masahiko; Osabe, Akio; Sakayori, Hiroyuki; and Mase, Akira, 5,024,255, Cl. 141-11.000.
Osafune, Haruo: *See—*
Suganuma, Katsuaki; Fujii, Hiroyuki; Minakuchi, Hiroyoshi; Kada, Katsuhiko; Osafune, Haruo; and Kanamaru, Kuniaki, 5,024,902, Cl. 428-633.000.

Osamu, Nakaguchi, to Fujisawa Pharmaceutical Co., Ltd. Hair restorer. 5,025,026, Cl. 514-356.000.
Osato, Yasukuni: *See—*
Suda, Hirohisa; Sasaki, Katsumi; and Osato, Yasukuni, 5,024,363, Cl. 225-96.005.
Osawa, Masanori, to Tenryu Marusawa Kabushiki Kaisha. Electromagnetic spring clutch. 5,024,311, Cl. 192-84.00T.
Oshikata, Hironobu: *See—*
Kamigaki, Masaharu; Oshikata, Hironobu; Kawata, Yoshihiro; Shiga, Nobuyasu; Omori, Hideharu; Kawashima, Masayuki; and Shimatani, Toshimichi, 5,025,441, Cl. 370-77.000.
Oshino, Yasuhiro: *See—*
Ueda, Mitsuru; Kanno, Tatsuya; Iguchi, Yoshihiro; and Oshino, Yasuhiro, 5,025,083, Cl. 528-199.000.
O'Sullivan, Joseph: *See—*
Aklonis, Carol A.; Ax, Helen A.; Kirsch, Donald R.; O'Sullivan, Joseph; Tymiak, Adrienne; and Wells, J. Scott, 5,024,839, Cl. 424-115.000.
Osumi, Masato: *See—*
Hirono, Yutaka; Kiyama, Seiichi; and Osumi, Masato, 5,024,724, Cl. 156-643.000.
Ota, Yoshifumi: *See—*
Nakamura, Kyuzo; Ota, Yoshifumi; and Yamada, Taiki, 5,024,854, Cl. 427-38.000.
Ota, Yusuke; and Swartz, Robert G., to AT&T Bell Laboratories. Burst mode digital data receiver. 5,025,456, Cl. 375-76.000.
Otfinoski, William F., to United Technologies Corporation. Abradable seal having particulate erosion resistance. 5,024,884, Cl. 428-328.000.
Otis Elevator Company: *See—*
Kameli, Nader, 5,024,296, Cl. 187-132.000.
Thangavelu, Kandasamy, 5,024,295, Cl. 187-125.000.
Otis Engineering Corp.: *See—*
Schwab, Carl M., Jr., 5,024,274, Cl. 166-303.000.
Otto, Dennis L., to Timken Company, The. Seal assembly for use with an overhang. 5,024,449, Cl. 277-37.000.
Ou, Szutsun S.: *See—*
Jansen, Michael; Sergant, Moshe; Ou, Szutsun S.; Wilcox, Jaroslava Z.; Yang, Jane J.; and Eaton, Larry R., 5,025,451, Cl. 372-50.000.
Outboard Marine Corporation: *See—*
Hartke, David J.; and Appelt, Kathleen A., 5,024,188, Cl. 123-195.00A.
Olson, Jeffrey A., 5,024,385, Cl. 239-410.000.
Ovassapian, Andranik; and Dye, John F., to Kendall Company, The. Intubating airway. 5,024,218, Cl. 128-200.260.
Owen, Hartley: *See—*
Harandi, Mohsen N.; and Owen, Hartley, 5,024,679, Cl. 44-449.000.
Owens-Corning Fiberglass Corporation: *See—*
Pollet, Jean C.; Williams, Gary L.; Armstrong, Gordon P.; and Flautt, Martin C., 5,024,890, Cl. 428-372.000.
Ozawa, Kazuo; and Sato, Masanori, to Sony Corporation. Tape cassette. 5,024,394, Cl. 242-198.000.
Paananen, Tapio: *See—*
Laine, Juhani; Nyman, Mikko; and Paananen, Tapio, 5,024,263, Cl. 165-1.000.
Pagano, Daniel M., to Eastman Kodak Company. Film cassette with built-in support for optical sensor to read film information. 5,025,274, Cl. 354-21.000.
Paist, Kenneth W.: *See—*
DiLullo, Joseph V.; Schifter, Stephan C.; Negin, Michael; and Paist, Kenneth W., 5,025,253, Cl. 340-825.060.
Palandjian, Philippe: *See—*
Maisonneuve, Jean-Michel; Domergue, Jean-Paul; Parize, Gabrielle; Palandjian, Philippe; and Isbert, Jacques, 5,024,502, Cl. 350-96.160.
Palermo, Robert E.: *See—*
DeCaul, Lorenzo C.; Han, Scott; Palermo, Robert E.; and Walsh, Dennis E., 5,025,109, Cl. 585-500.000.
Palmer, Marcia R. Clothing item. 5,023,952, Cl. 2-69.000.
Pan, Yuh-Guo; and Hochman, Lana, to Clairol Incorporated. Nitroaniline dyes with a cyano substituent group. 5,024,673, Cl. 8-414.000.
Panagin, Romano, to Fiat Ferroviaria S.p.A. Self-steering bogie for a railway vehicle. 5,024,165, Cl. 105-168.000.
Papamichos, Euripides: *See—*
Vardoulakis, Ioannis; Labuz, Joseph F.; and Papamichos, Euripides, 5,024,103, Cl. 73-819.000.
Pape, Robert; Rose, William; Burgel, Frank; and Adams, Chip, to Sonin, Inc. Multiple blade handsaw. 5,023,996, Cl. 30-144.000.
Papp, Karel. Sprung bicycle seat post. 5,024,413, Cl. 248-623.000.
Pappas, James L.: *See—*
Seiler, Larry D.; Pappas, James L.; and Rose, Robert C., 5,025,249, Cl. 340-721.000.
Parize, Gabrielle: *See—*
Maisonneuve, Jean-Michel; Domergue, Jean-Paul; Parize, Gabrielle; Palandjian, Philippe; and Isbert, Jacques, 5,024,502, Cl. 350-96.160.
Park, Chinsoo: *See—*
Campbell, Neil E.; and Park, Chinsoo, 5,024,727, Cl. 156-663.000.
Park, Yong; and Lee, Seo K., to Goldstar Electron Co. Method of fabricating a BCCD channel with stair-case doping by self-alignment. 5,024,963, Cl. 437-41.000.
Parke, Frederic I., to New York Institute of Technology. Method and apparatus for generating animated images. 5,025,394, Cl. 364-518.000.
Parker Hannifin Corporation: *See—*
Burge, Donald G., 5,024,468, Cl. 285-39.000.
Parks, Carol A.; Probst, Robert E.; Rajagopal, Doraiswamy; and Youngs, Gary L., to International Business Machines Corporation. Method and apparatus for merging a digitized image with an alphanumeric character string. 5,025,396, Cl. 364-518.000.
Parrilla, Vicente. Compositions for the treatment of skin injuries. 5,024,838, Cl. 424-94.650.
Parrott, Wayne A.: *See—*
Collins, Glenn B.; Hildebrand, David F.; Lazzeri, Paul A.; Adams, Thomas R.; Parrott, Wayne A.; and Hartweck, Lynn M., 5,024,944, Cl. 435-172.300.
Parsons, J. Stuart: *See—*
Gasaway, Jack S.; Parsons, J. Stuart; and Harshman, Robert L., 5,024,656, Cl. 604-70.000.
Parulski, Kenneth A.; and Kessler, David, to Eastman Kodak Company. System for minimizing optical distortions and chromatic aberrations in a linear color scanner. 5,025,313, Cl. 358-54.000.
Parzl, Franz; and Eichinger, Johann, to Carl Hurth Maschinen- und Zahnradfabrik GmbH & Co. Transmission housing with a support for a shaft carrying at least one gear. 5,024,122, Cl. 74-606.00R.
Paskowski, Frank: *See—*
Gero, William; and Paskowski, Frank, 5,023,986, Cl. 29-163.600.
Passero, Adolfo: *See—*
Scata, Mario; and Passero, Adolfo, 5,024,316, Cl. 198-369.000.
Pastor, Jose. Recognition method for character set. 5,025,479, Cl. 382-38.000.
Patoiseau, Jean F.; Autin, Jean-Marie; Cousse, Henri; Sales, Veronique; Tisne-Versailles, Jacky; and Bali, Jean-Pierre, to Pierre Fabre Medicament. Thioformamidines, and use as medicaments. 5,025,015, Cl. 514-274.000.
Patterson, John F.: *See—*
Busch, Raymond A.; and Patterson, John F., 5,024,426, Cl. 267-158.000.
Patzelt, Norbert; and von Seebach, Michael, to Krupp Polysius AG. Separator. 5,024,754, Cl. 209-135.000.
Pauer, Dieter, to Alcatel N.V. Method of and circuit arrangement for recovering a bit clock from a received digital communication signal. 5,025,461, Cl. 375-119.000.
Paula, Kyle S. Reusable, flexible bag with foldable support structure. 5,024,344, Cl. 220-9.300.
Pauly, John M.; and Nishimura, Dwight G., to Leland Stanford Junior University, The Board of Trustees of the. Magnetic resonance imaging of short T_2 species. 5,025,216, Cl. 324-309.000.
Paumard, Eric; Mutez, Sylvain; Mortreux, Andre; and Petit, Francis, to Norsolor. Catalyst system, process for its preparation and its application to the manufacture of aldehydes. 5,024,983, Cl. 502-167.000
Pavio, Anthony M., to Texas Instruments Incorporated. Monolithic multilayer planar transmission line. 5,025,232, Cl. 333-26.000.
Pearson, Steve: *See—*
Needham, Thomas E.; Wright, Jeremy C.; Pearson, Steve; Chilamkurti, Rao; and Kopp, Clinton V., 5,024,657, Cl. 604-85.000.
Pease, George E., Jr.; Romero, Ervin G.; and Glasenapp, Rudi K. H., to Boeing Company, The. Automatic aircraft braking system including wheelspeed responsive control apparatus. 5,024,491, Cl. 303-93.000.
Pechiney Recherche: *See—*
Gaspard, Jean R., 5,025,219, Cl. 324-447.000.
Pellerin, Roy F.; and Ross, Robert J., to Washington State University Research Foundation, Inc. Non-destructive evaluation of structural members. 5,024,091, Cl. 73-597.000.
Penn, Thomas C.: *See—*
Porter, Vernon R.; and Penn, Thomas C., 5,024,918, Cl. 430-269.000.
Penticoff, Amy M.; and Lyon, John D., to Dow Corning Corporation. Method for processing aqueous fermentation broths. 5,024,937, Cl. 435-41.000.
Perkins Manufacturing Company: *See—*
Redding, John W.; and Zelinka, Robert F., 5,024,573, Cl. 414-408.000.
Perner, Johannes: *See—*
Oftring, Alfred; Birnbach, Stefan; Fikentscher, Rolf; Baur, Richard; Kud, Alexander; Goeckel, Ulrich; and Perner, Johannes, 5,025,103, Cl. 560-170.000.
Perona, Mark; Woller, Tom C.; and Guy, Jon S., to Cipher Data Products, Inc. Auto-loading transport for tape cartridge with tape access door and belt capstan roller. 5,025,334, Cl. 360-96.500.
Perrine, Susan, to Children's Hospital Medical Center of Northern California. Method for augmenting fetal hemoglobin. 5,025,029, Cl. 514-381.000.
Perry, Mordechai: *See—*
Linder, Charles; Perry, Mordechai; Nemas, Mara; and Katraro, Reuven, 5,024,765, Cl. 210-651.000.
Perz, John S.: *See—*
Piedrahita, Carlos A.; Quinn, Robert E.; and Perz, John S., 5,025,085, Cl. 528-230.000.
Peters, Jeffrey L.; and Orth, Jeffrey L., to Rocky Mountain Research, Inc. Retrograde perfusion system, components and method. 5,024,668, Cl. 606-194.000.
Peters, Roger. Rotary chuck for centering and retaining data discs. 5,025,340, Cl. 360-99.120.
Petersen, Helle B., to Milliken Denmark A/S. Dust control mat and method of manufacturing same. 5,024,868, Cl. 428-88.000.
Peterson, Christer C. I., to Aktiebolaget Electrolux. Brazing or soldering method and device including a laminar flow or gaseous flux. 5,025,125, Cl. 219-85.110.
Peterson, Robert H.; and McGurk-Burleson, Erin, to Baxter International Inc. Artificial ligament of differential weave structure. 5,024,669, Cl. 623-13.000.

Petit, Francis: *See*—
Paumard, Eric; Mutez, Sylvain; Mortreux, Andre; and Petit, Francis, 5,024,983, Cl. 502-167.000.
Petit, Gaston; and Monteiro, Daniel. Device for pitting fruit, particularly prunes. 5,024,147, Cl. 99-549.000.
Petitjean, Luc; and Valdois, Michel, to Schlumberger Technology Corporation. Pressure sensor useable in oil wells. 5,024,098, Cl. 73-729.000.
Petranek, Milan: *See*—
Fucik, Borivoj; Petranek, Milan; and Smital, Frantisek, 5,024,068, Cl. 66-53.000.
Petrelli, Luigi, to Alfa Lancia Industriale S.p.A. Bodywork for automobiles. 5,024,480, Cl. 296-146.000.
Petrick, Mark: *See*—
Anderson, Donald J.; Duerksen, John H.; McCallum, Doug J.; and Petrick, Mark, 5,024,275, Cl. 166-303.000.
Pettigrew, Michel J.; Rhodes, David B.; Lux, Eric G.; and Mason, Victor A., to HDRK Mining Research Limited. Loose rock detector. 5,024,090, Cl. 73-572.000.
Pfaffmann, George D.; Kubis, Charles S.; Currie, John P.; Balzer, Norbert R.; Walter, John; and Adams, Graham R., to Continental Can Company, Inc. Apparatus and method for sealing a lid onto a container. 5,025,123, Cl. 219-10.750.
Pfeil, Richard A., Jr.; and Pirrera, Charles M., to Terrestrial Engineering Corporation. Recovery processing and storage unit. 5,024,061, Cl. 62-77.000.
Pfenninger, Johannes, to Ciba-Geigy Corporation. Pearlescent coating compositions. 5,025,041, Cl. 523-171.000.
Pfiester, James R., to Motorola, Inc. CMOS process using doped glass layer. 5,024,959, Cl. 437-34.000.
Pfisterer, Richard E.: *See*—
Roizen, Michael; Turcotte, William E., II; and Pfisterer, Richard E., 5,025,374, Cl. 364-413.020.
Pfizer Hospital Products Group, Inc.: *See*—
Vasconcellos, Alfred V.; and Keeler, Preston J., III, 5,024,613, Cl. 604-4.000.
PFM, Inc.: *See*—
Morris, Alvin L., 5,024,386, Cl. 241-3.000.
Phaff, Rox: *See*—
Zink, Rudolf; and Phaff, Rox, 5,024,988, Cl. 503-212.000.
Phase Dynamics, Inc.: *See*—
Scott, Bentley N.; and Shortes, Samuel R., 5,025,222, Cl. 324-639.000.
Phebus, Dan E.; Schrader, William A.; and Summers, Russell E., Jr., to Fairfield Manufacturing Company, Inc. Planetary wheel hub. 5,024,636, Cl. 475-141.000.
Philip Morris Incorporated: *See*—
Garthaffner, Martin T.; Keen, Billy J., Jr.; Gillespie, Andrew J.; Wheless, Jack C.; and Dingus, George W., 5,024,242, Cl. 131-94.000.
Phillips Petroleum Company: *See*—
Bobsein, Rex L.; Stone, Mark L.; and Geibel, Jon F., 5,024,876, Cl. 428-272.000.
Hawley, Gil P.; and McDaniel, Max P., 5,024,982, Cl. 502-110.000.
Sughrue, Edward L., II; Tooley, Patricia A.; Bertus, Brent J.; and Grayson, Bille S., 5,024,750, Cl. 208-57.000.
Tooley, Patricia A.; Cheung, Tin-Tack P.; Cymbaluk, Ted H.; Nowack, Gerhard P.; and Johnson, Marvin M., 5,024,683, Cl. 55-74.000.
Phinney, Thomas L., to Honeywell Inc. Apparatus for providing multiple controller interfaces to a standard digital modem and including integral conflict resolution. 5,025,500, Cl. 370-85.130.
Phoenix Microsystems, Inc.: *See*—
Clayton, James L.; and Gewin, Robert E., 5,025,444, Cl. 371-34.000.
Picker International, Inc.: *See*—
Lindstrom, Walter W.; and Dinewitz, Isaac, 5,024,230, Cl. 128-654.000.
Piedrahita, Carlos A.; Quinn, Robert E.; and Perz, John S., to Lubrizol Corporation, The. Curable aminoplast compositions and catalysts for curing same. 5,025,085, Cl. 528-230.000.
Pien, Pao C. Multi-fuel compression-ignition engine and fuel injection pump therefor. 5,024,195, Cl. 123-304.000.
Pierce, Kirby L.; and Kanouse, Richard C., to Midwest Blast Products, Inc. Airless blast cleaning wheel and housing. 5,024,028, Cl. 51-432.000.
Pierre Fabre Medicament: *See*—
Patoiseau, Jean F.: Autin, Jean-Marie; Cousse, Henri; Sales, Veronique; Tisne-Versailles, Jacky; and Bali, Jean-Pierre, 5,025,015, Cl. 514-274.000.
Pile, Sam R.: *See*—
Mydill, Marc R.; Pile, Sam R.; O'Keefe, Sheila; Okerblom, Neal F.; and Keenan, W. Russ, 5,025,205, Cl. 324-73.100.
Pinand, Henry. Hand tool. 5,024,565, Cl. 408-121.000.
Pinholster, Daniel F., Jr.: *See*—
Blakely, Lawrence W.; Howe, Michael A.; Pinholster, Daniel F., Jr.; Terry, Claude E.; and McIntosh, Robert H., Sr., 5,024,840, Cl. 424-404.000.
Pinnow, Curtis C.: *See*—
Fortmann, Robert C.; Pinnow, Curtis C.; Kuschewski, Gustav; and Joseph, William A., Jr., 5,025,132, Cl. 219-401.000.
Pion, Albert L.: *See*—
Haines, John G.; Rosenbaum, Nolan G.; Pion, Albert L.; Lecarpentier, Marc; Henriot, Christophe; and Abumehdi, Cyrus, 5,025,383, Cl. 364-464.030.
Pioneer Electronic Corporation: *See*—
Funabashi, Tadashi; and Kenmotsu, Isami, 5,025,440, Cl. 369-199.000.
Kato, Takahiro, 5,025,401, Cl. 364-561.000.
Komaki, Toshihiro; Kudo, Hideo; Ishizuki, Tomonori; and Yokozeki, Shinichi, 5,025,439, Cl. 369-100.000.
Naito, Ryuichi, 5,025,431, Cl. 369-36.000.
Naito, Ryuichi, 5,025,432, Cl. 369-36.000.
Tateishi, Kiyoshi; Sakata, Haruyasu; Tawaragi, Yuji; Suzuki, Masanori; and Ohie, Takayuki, 5,025,434, Cl. 369-44.360.
Piorunneck, Heinz, to Burndy Corporation. High-density bi-level card edge connector and method of making the same. 5,024,609, Cl. 439-637.000.
Pipp Mobile Systems, Inc.: *See*—
Leist, Alan R., 5,024,164, Cl. 105-101.000.
Pirl, William E., to Westinghouse Electric Corp. Support equipment for a combination eddy current and ultrasonic testing probe for inspection of steam generator tubing. 5,025,215, Cl. 324-220.000.
Pirrera, Charles M.: *See*—
Pfeil, Richard A., Jr.; and Pirrera, Charles M., 5,024,061, Cl. 62-77.000.
Pitman, John L.; and McCauley, Kyn A. Watering control system. 5,025,361, Cl. 364-143.000.
Pitney Bowes Inc.: *See*—
Bannister, Raymond L.; Close, Frederick C.; and Loeber, Peter J., 5,024,153, Cl. 101-91.000.
Raikes, Terry E.; Kramer, William L.; Howard, John B.; Moore, Wayne D.; Jackson, Louis; and Kotecki, Jeffrey D., 5,024,282, Cl. 177-25.150.
Pitts, Warren R.; Estrada, hayden F.; and West, Peter, to Dennison Manufacturing Company. Erasably markable articles and methods of making such articles. 5,024,898, Cl. 428-511.000.
Pituch, Daniel W. Medical needle sheath holding apparatus. 5,024,666, Cl. 604-263.000.
Pixar: *See*—
Cook, Robert L.; Porter, Thomas K.; and Carpenter, Loren C., 5,025,400, Cl. 364-522.000.
Pless, Benjamin D.: *See*—
Carroll, Kenneth J.; and Pless, Benjamin D., 5,025,172, Cl. 307-261.000.
Plissonneau, Bernard: *See*—
Barquet, Henri; Negroni, Pierre-Paul; and Plissonneau, Bernard, 5,024,399, Cl. 244-119.000.
Plotnikov, Andrei D.: *See*—
Popov, Nikolai P.; Plotnikov, Andrei D.; and Klotsvog, Grigory N., 5,024,124, Cl. 74-625.000.
Plumail, Jean-Claude: *See*—
Giuliani, Pierre; Le Page, Jean-Francois; Plumail, Jean-Claude; and Espaillac, Marcellin, 5,024,751, Cl. 208-108.000.
Pohl, Wolfgang D.: *See*—
Durig, Urs T.; Fischer, Ulrich C.; and Pohl, Wolfgang D., 5,025,147, Cl. 250-216.000.
Poisel, Hans; and Trommer, Gert, to Messerschmitt-Boelkow-Blohm GmbH. Laser warning sensor with frequency-coded position information. 5,025,148, Cl. 250-227.120.
Polaroid Corporation: *See*—
Chiang, Yunn H.; and Gaudiana, Russell A., 5,024,989, Cl. 503-227.000.
Minns, Richard A.; Bloom, Iris B. K.; and Ramharack, Roopram, 5,024,507, Cl. 350-96.340.
Polk, Roger N.: *See*—
Bennett, Glenn E.; Lucius, John E.; Polk, Roger N.; Rider, Frederick H.; and Szczesny, David S., 5,024,627, Cl. 439-631.000.
Pollet, Jean C.; Williams, Gary L.; Armstrong, Gordon P.; and Flautt, Martin C., to Owens-Corning Fiberglass Corporation. Size composition for impregnating filament strands and glass fibers coated therein. 5,024,890, Cl. 428-372.000.
Pollich, Gerhard: *See*—
Thunker, Norbert; Pollich, Gerhard; and Luxem, Heiner, 5,024,432, Cl. 271-268.000.
Pomar, Eliodoro. Variable compression ratio internal combustion rotating engine. 5,024,192, Cl. 123-245.000.
Pompe, Larry W. Contact lens surface treatment apparatus. 5,023,971, Cl. 15-97.100.
Popov, Nikolai P.; Plotnikov, Andrei D.; and Klotsvog, Grigory N. Electric drive with manual doubler. 5,024,124, Cl. 74-625.000.
Popp, George: *See*—
Mueller, Wolfgang F.; Popp, George; and Vandergheynst, George B., 5,024,127, Cl. 83-13.000.
Porter, Thomas K.: *See*—
Cook, Robert L.; Porter, Thomas K.; and Carpenter, Loren C., 5,025,400, Cl. 364-522.000.
Porter, Vernon R.; and Penn, Thomas C., to Texas Instruments Incorporated. Heat activated dry development of photoresist by means of active oxygen atmosphere. 5,024,918, Cl. 430-269.000.
Possati, Mario, to MARPOSS Societa' per Azioni. Apparatus with a supporting frame and process for manufacturing such a frame. 5,024,002, Cl. 33-549.000.
Power Pack International B.V. i.o.: *See*—
Riel, Leslie L., 5,024,373, Cl. 229-68.00R.
Prairietek Corporation: *See*—
Morehouse, James H.; Furay, David M.; Blagaila, John; Dion, F. Eugene; Shelstad, Scott A.; and Woods, Jimmy L., 5,025,336, Cl. 360-97.020.
Pramanick, Protap, to Com Dev Ltd. Microstripline interdigital planar filter. 5,025,235, Cl. 333-204.000.

Pratt, Bruce: *See—*
Chu, George H.; Ogawa, Yasushi; McPherson, John M.; Ksander, George; Pratt, Bruce; Hendricks, Diana; and McMullin, Hugh, 5,024,841, Cl. 424-422.000.

Precision Fabrics Group Inc.: *See—*
Goad, Conrad D.; and Taylor, Jeffrey L., 5,024,851, Cl. 427-2.000.

Precision Lapping & Optical Co., Inc.: *See—*
Bleier, Zvi; and Lipkins, Morton S., 5,024,514, Cl. 350-618.000.

Prelini, Cesare; Trovati, Aldo; Gambini, Tiziana; and Stefanoli, Vittorio, to Raffineria Olii Lubrificanti "R.O.L" S.p.A. Process for improving the dyeability of woven or non-woven textiles: pre-treatment with aqueous dispersion of polyurethane containing random cationic groups. 5,024,674, Cl. 8-554.000.

President & Fellows of Harvard College: *See—*
Brenner, Michael B.; Strominger, Jack L.; Seidman, Jonathan; Ip, Stephen H.; and Krangel, Micahel S., 5,024,940, Cl. 435-69.100.

Pressure Services, Inc.: *See—*
Suggs, Steven M., 5,024,453, Cl. 277-106.000.

Presto Products, Incorporated: *See—*
Buchman, James E.; and Jahnke, Kenneth C., 5,024,642, Cl. 493-193.000.

Preston, David M.: *See—*
Oliver, James L.; Juriga, James A.; Walton, Erlen B.; and Preston, David M., 5,024,463, Cl. 280-718.000.

Pretchel, David A.: *See—*
Cloud, Randy G.; and Pretchel, David A., 5,024,798, Cl. 264-272.150.

Price, David E.: *See—*
Kahl, W. Henry; Price, David E.; and Tsao, Nai-Cheng, 5,024,471, Cl. 292-97.000.

Price, Thomas W. Ladder assembly. 5,024,291, Cl. 182-85.000.

Priddy, Tommy G.: *See—*
Gregory, Danny L.; Priddy, Tommy G.; Smallwood, David O.; and Woodall, Tommy D., 5,024,096, Cl. 73-663.000.

Principia Recherche Developpement SA: *See—*
Guevel, Pierre M.; and Bardey, Philippe R., 5,024,396, Cl. 244-35.00R.

Prins, Hendrik J.: *See—*
Janssen, Augustus J. E. M.; Veldhuis, Raymond N. J.; Prins, Hendrik J.; and Vries, Lodewijk B., 5,025,404, Cl. 364-723.000.

Prinz, Gary A., to United States of America, Navy. Thin film magnetic memory elements. 5,025,416, Cl. 365-170.000.

Pritchard, Edward E.: *See—*
Edwards, James C.; and Pritchard, Edward E., 5,024,397, Cl. 294-68.230.

Probst, Robert E.: *See—*
Parks, Carol A.; Probst, Robert E.; Rajagopal, Doraiswamy; and Youngs, Gary L., 5,025,396, Cl. 364-518.000.

Prouty, Lee J. Method and apparatus for cleaning can openers. 5,024,704, Cl. 134-6.000.

Purens, Alfred, to AT&T Bell Laboratories. Tilt and swivel apparatus for a display monitor. 5,024,415, Cl. 248-923.000.

Pusic, Pavo. Automated mail collecting and telecommunication machine II. 5,025,386, Cl. 364-478.000.

Pyles, Robert A.: *See—*
Jorissen, Steven A.; Lundy, Charles E.; Krishnan, Sivaram; Mafoti, Robson; and Pyles, Robert A., 5,025,056, Cl. 524-310.000.

Pyropower Corporation: *See—*
Tank, John T., 5,024,684, Cl. 55-92.000.

Quarles, William B., Jr. Lightweight articulated advertising display. 5,024,015, Cl. 40-605.000.

Quinn, Robert E.: *See—*
Piedrahita, Carlos A.; Quinn, Robert E.; and Perz, John S., 5,025,085, Cl. 528-230.000.

R-Byte, Inc.: *See—*
Feinberg, Howard A.; and Rees, Theodore D., 5,025,333, Cl. 360-85.000.

Rabins. Leonard: *See—*
Koegel, Robert J.; and Rabins, Leonard, 5,025,370, Cl. 364-200.000.

Radcliffe, Scott T.: *See—*
Hanson, Reed D.; and Radcliffe, Scott T., 5,024,460, Cl. 280-707.000.

Radewahn, Siegfried: *See—*
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RAF Electronics Corp.: *See—*
Flasck, Richard A., 5,024,524, Cl. 353-31.000.

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Minns, Richard A.; Bloom, Iris B. K.; and Ramharack, Roopram, 5,024,507, Cl. 350-96.340.

Ramirez, Bruno J.: *See—*
Sandel, Dan; Horan, Robert T.; Gaba, Rodolfo; and Ramirez, Bruno J., 5,024,326, Cl. 206-366.000.

Ramsay, Ronald, to Academy of Applied Science, a part interest. Magnetic workpiece clamping blocks. 5,024,428, Cl. 269-274.000.

Ramstedt, Clarence F., to United States of America, Navy. Pulsed field system for detecting the presence of a target in a subsurface environment. 5,025,218, Cl. 324-334.000.

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Rohrer, George A.; and McMillin, Larry D., 5,024,964, Cl. 437-47.000.

Randall, Joseph G., to North East Form Engineering, Inc. Cutting apparatus. 5,024,563, Cl. 408-1.00R.

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Jubin, Robert T.; and Randolph, John D., 5,024,647, Cl. 494-37.000.

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Rasilewicz, Casimir E., to Nestec S.A. Liquid coffee whitener. 5,024,849, Cl. 426-656.000.

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Smid, Johannes; Cabasso, Israel; Obligin, Alan; and Rawls, H. Ralph, 5,024,232, Cl. 128-654.000.

Raychem Corporation: *See—*
van Konyenburg, Peter H.; and Au, Andrew, 5,025,131, Cl. 392-451.000.

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Tajima, Yusuke; and Gels, Robert G., 5,025,225, Cl. 330-124.00D.
Wilson, David T.; and Tancrell, Roger H., 5,024,872, Cl. 428-212.000.

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RCA Licensing Corporation: *See—*
Canfield, Barth A., 5,025,496, Cl. 358-153.000.
Isnardi, Michael A., 5,025,309, Cl. 358-12.000.

Reche, John J. Hybrid circuit structure fabrication methods using high energy electron beam curing. 5,024,969, Cl. 437-173.000.

Redding, John W.; and Zelinka, Robert F., to Perkins Manufacturing Company. Lifting device. 5,024,573, Cl. 414-408.000.

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Bulso, Joseph D., Jr.; and McClung, James A., 5,024,077, Cl. 72-336.000.

Redmon, Gerald W.; and Redmon, Tina L. Improved spray apparatus for concrete finishing machines. 5,024,384, Cl. 239-289.000.

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Redmon, Gerald W.; and Redmon, Tina L., 5,024,384, Cl. 239-289.000.

Rees, Theodore D.: *See—*
Feinberg, Howard A.; and Rees, Theodore D., 5,025,333, Cl. 360-85.000.

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Reichel, Gunter. Shower unit panel. 5,023,965, Cl. 4-607.000.

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Smith, Tempel, Jr.; Miletic, Veselko; Bayer, George; Coutre, Christopher A.; Reichel, William L.; and Chronowski, Mirek J., 5,025,223, Cl. 324-662.000.

Reichert, Alberto J.: *See—*
Reichert, Ricardo H.; and Reichert, Alberto J., 5,024,358, Cl. 224-35.000.

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Reiff, Helmut; and Lorenz, Otto, to Bayer Aktiengesellschaft. Process for the production of aqueous polyurethane dispersions. 5,025,064, Cl. 524-591.000.

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Geisen, Pierre; and Reillaudoux, Jean-Claude, 5,024,886, Cl. 428-332.000.

Reilly, Joseph W. Method and apparatus for protection against coastal erosion. 5,024,560, Cl. 405-303.000.

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Reinicke, Robert H.; Mohtar, Rafic; and Nelson, Richard O., to Eaton Corporation. Fluid flow rate control device. 5,024,418, Cl. 251-129.110.

Reinoehl, Robert F., to Aquaria, Inc. Bubble trap for epoxy sealant in a submersible electric motor. 5,025,185, Cl. 310-87.000.

Reisman, Arnold; and Turlik, Iwona, to MCNC; and Northern Telecom Limited. High density semiconductor structure and method of making the same. 5,025,304, Cl. 357-71.000.

Relenyi, Attila G.; and Gartner, Charles D., to Dow Chemical Company, The. Process for the preparation of antimicrobial formulations of 2-(alkylthio)ethanamine hydrohalides. 5,025,038, Cl. 514-665.000.

Renaud, Alain: *See—*
Naylor, Robert J.; Naylor, Brenda; Renaud, Alain; and Langlois, Michel, 5,025,022, Cl. 514-305.000.

Renaudin, Robert; and Tchatalian, Bruno. Emergency device for the control of the displacement for a carrier conveying a nuclear fuel assembly. 5,024,803, Cl. 376-270.000.

Renault, Christian: *See—*
Barreau, Michel; Hardy, Jean-Claude; Martin, Jean-Paul; and Renault, Christian, 5,025,013, Cl. 514-253.000.

Rene Tourolle et Fils (Societe A Responsabilite Limitee): *See—*
Simonetto, Charles M., 5,024,075, Cl. 72-38.000.

Renishaw plc: *See—*
Darlington, Alan D.; and Waggitt, Kevin P., 5,025,362, Cl. 364-167.010.

Repine, Joseph T.: *See—*
Doherty, Annette M.; Hudspeth, James P.; Kaltenbronn, James S.; Repine, Joseph T.; Roark, William H.; Sircar, Ila; and Tinney, Francis J., 5,024,994, Cl. 514-18.000.

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Smid, Johannes; Cabasso, Israel; Obligin, Alan; and Rawls, H. Ralph, 5,024,232, Cl. 128-654.000.

Rexnord Corporation: *See—*
Hawley, Erwin T.; and Kladden, Gregory S., 5,024,450, Cl. 277-37.000.

Rhodes, David B.: *See—*
Pettigrew, Michel J.; Rhodes, David B.; Lux, Eric G.; and Mason, Victor A., 5,024,090, Cl. 73-572.000.

Rhodes, Melvin H., to United States of America, Air Force. Incremental integrator circuit. 5,025,224, Cl. 328-127.000.

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Canivenc, Edith; Forestier, Serge; Gay, Michel; Lang, Gerard; and Richard, Herve, 5,025,053, Cl. 524-265.000.

Rhone-Poulenc Sante: *See—*
Barreau, Michel; Hardy, Jean-Claude; Martin, Jean-Paul; and Renault, Christian, 5,025,013, Cl. 514-253.000.

Richard, Herve: *See—*
Canivenc, Edith; Forestier, Serge; Gay, Michel; Lang, Gerard; and Richard, Herve, 5,025,053, Cl. 524-265.000.

Richard Wolf GmbH: *See—*
Bonnet, Ludwig; and Wetterauer, Ulrich, 5,024,212, Cl. 128-4.000.

Richards, David W.; and Murphy, Kent A., to Center for Innovative Technology; Virginia Commonwealth University; and Virginia Polytechnic Institute and State University. Ophthalmic contact lens with internal fixation light for examination of the optic nerve. 5,024,518, Cl. 351-219.000.

Richenberg, Carl B.: *See—*
Lougheed, Edgar P.; Richenberg, Carl B.; and Chen, Stephen P., 5,024,929, Cl. 430-546.000.

Ricles, Thomas D., to Dresser Industries, Inc. Running tool for use in well bores. 5,024,277, Cl. 166-381.000.

Ricoh Company, Ltd.: *See—*
Emoto, Masami, 5,025,438, Cl. 369-112.000.
Ilyama, Kiyotaka; Hayakawa, Kunio; Nakata, Masahiro; Kodera, Kaoru; and Miyazaki, Osamu, 5,024,699, Cl. 106-21.000.
Kanno, Tetsuo; Kotake, Yasushi; and Inada, Hitoshi, 5,025,339, Cl. 360-99.060.
Ohuchi, Satoshi, 5,025,481, Cl. 382-53.000.
Oikawa, Tomohiro, 5,024,496, Cl. 350-6.800.
Seki, Nobuyoshi; Morii, Nobuyuki; Sugiyama, Yoshihide; Komada, Takashi; Hosoi, Masatoshi; Hujiwara, Atuhisa; Ichinose, Tsutomu; Mori, Goro; Kikuchi, Toshiyuki; and Minato, Masahiro, 5,024,430, Cl. 270-53.000.
Yamada, Katsuyuki; Ide, Yukio; Harigaya, Makoto; and Iwasaki, Hiroko, 5,024,927, Cl. 430-495.000.

Rideout, William C.: *See—*
Boudreau, Robert A.; and Rideout, William C., 5,024,504, Cl. 350-96.180.

Rider, Frederick H.: *See—*
Bennett, Glenn E.; Lucius, John E.; Polk, Roger N.; Rider, Frederick H.; and Szczesny, David S., 5,024,627, Cl. 439-631.000.

Riedinger, Thomas R.; and White, Thomas H., to Boeing Company, The. Office module for passenger aircraft. 5,024,398, Cl. 244-118.500.

Riel, Leslie L., to Riel, Leslie L.; van der Tak, Hendrik; Ghafoerkhan, Shafiq M.; and Power Pack International B.V. i.o. Container for pulverized and granular products, such as medicines. 5,024,373, Cl. 229-68.00R.

Riemer, Horst H., to Mendle Limited. Plastics bottle. 5,024,339, Cl. 215-1.00C.

Riker, Paul J.: *See—*
Christenson, Philip A.; Eilerman, Robert G.; Riker, Paul J.; and Drake, Brian J., 5,024,847, Cl. 426-535.000.

Riley, David: *See—*
Stackpool, Michael; and Riley, David, 5,024,675, Cl. 29-623.100.

Ringe, Mitchell L., to General Mills, Inc. R-T-E cereal with soluble fibers. 5,024,996, Cl. 514-54.000.

Riou, Jacques: *See—*
Lecourt, Guy; and Riou, Jacques, 5,024,712, Cl. 156-184.000.

Ripley, Donald W. Real estate sign fastener. 5,024,410, Cl. 248-302.000.

Rischke, Jorg W.; Loermans, Peter J. G.; and Huvenaars, Peter J. M., to MECO Equipment Engineers B.V. Apparatus for treating strip-shaped elements. 5,024,745, Cl. 204-198.000.

Ritala, Risto; Laakso, Mikko; and Koponen, Jari, to Kagaani Elektroniikka OY. Procedure and means for measuring paper formation. 5,025,154, Cl. 250-308.000.

Ritchie, Herbert L., Jr.: *See—*
Mordue, George S.; and Ritchie, Herbert L., Jr., 5,025,198, Cl. 318-434.000.

Riter Machine Works, Ltd.: *See—*
Lang, Helfried, 5,023,977, Cl. 19-115.00R.

RJS Corporation: *See—*
Slezak, Raymond J., 5,024,477, Cl. 294-81.200.

Roark, William H.: *See—*
Doherty, Annette M.; Hudspeth, James P.; Kaltenbronn, James S.; Repine, Joseph T.; Roark, William H.; Sircar, Ila; and Tinney, Francis J., 5,024,994, Cl. 514-18.000.

Robb, Stephen P.: *See—*
Fay, Gary V.; Robb, Stephen P.; Sutor, Judith L.; and Terry, Lewis E., 5,025,298, Cl. 357-41.000.

Robbins, Jack; and Nagel, Dietmar. Sound producing remote control toy vehicle. 5,024,626, Cl. 446-409.000.

Robbins, William D. Toy bat assembly. 5,024,435, Cl. 273-26.00B.

Robert Bosch GmbH: *See—*
Dobler, Klaus; and Hachtel, Hansjorg, 5,025,213, Cl. 324-207.120.
Doege, Mathias; and Frey, Wunibald, 5,025,136, Cl. 219-508.000.
Dreier, Friedrich; and Fischer, Ernst, 5,024,540, Cl. 384-203.000.
Karnopp, Dean, 5,024,302, Cl. 188-299.000.

Roberts, Joni A.: *See—*
Bleich, Larry L.; Roberts, Joni A.; and Zerbs, Stephen T., 5,024,864, Cl. 427-424.000.

Robertshaw Controls Company, Inc.: *See—*
Holtkamp, Calvin J.; Hetrick, George L.; and Warren, Richard, 5,025,242, Cl. 337-309.000.

Robertson, Bengt; and Curstedt, Tore, to Chiesi Farmaceutici S.p.A. Natural pulmonary surfactant, method of preparation and pharamceutical compositions. 5,024,995, Cl. 514-21.000.

Robinbrosse, Christian; Naslain, Roger; Minet, Jacky; and Langlais, Francis, to Societe Europeenne de Propulsion. Composite material with zirconia matrix. 5,024,878, Cl. 428-297.000.

Robine, Alain: *See—*
Cameron, Charles; Mimoun, Hubert; Robine, Alain; Bonnaudet, Serge; Chaumette, Patrick; and Dang Vu, Quang, 5,025,108, Cl. 585-500.000.

Robinson, Leslie K. Relating to ram units in transmissions of the toroidal race, rolling traction type. 5,024,635, Cl. 475-115.000.

Robison, Gary L., to Eastman Kodak Company. Magnetic recording on film of scene parameters and photofinishing process for use therewith. 5,025,283, Cl. 355-40.000.

Robotic Originals, Inc.: *See—*
Anderson, Roger, 5,024,575, Cl. 414-627.000.

Rockwell International Corporation: *See—*
Soclof, Sidney I., 5,025,302, Cl. 357-55.000.
Yeh, Pochi A.; and Hong, John H., 5,025,488, Cl. 455-619.000.

Rocky Mountain Research, Inc.: *See—*
Peters, Jeffrey L.; and Orth, Jeffrey L., 5,024,668, Cl. 606-194.000.

Rodite, Robert R.: *See—*
Dinan, Raymond F.; Fallon, Hugh C.; Malin, Jerald R.; Rodite, Robert R.; Rohe, Clair F.; and Rohrer, Gene D., 5,025,483, Cl. 382-58.000.

Rodriguez, Alan. Post-tensioning anchor. 5,024,032, Cl. 52-223.00L.

Rodriguez, Herman R.: *See—*
Bhagwat, Shripad S.; Main, Alan J.; and Rodriguez, Herman R., 5,025,025, Cl. 514-340.000.

Rodriguez, Norton. Vest or like article of clothing for carrying rechargeable batteries. 5,024,360, Cl. 224-215.000.

Rodriguez, Susan B.: *See—*
Thornton, Roy J.; and Rodriguez, Susan B., 5,024,845, Cl. 426-15.000.

Roessler, Dennis E., to Halliburton Logging Services, Inc. Drill pipe downhole unthreading apparatus. 5,024,272, Cl. 166-117.700.

Rogers Corporation: *See—*
Arthur, David J.; and Swei, Gwo S., 5,024,871, Cl. 428-209.000.

Rogers, Howard H.; and Herrin, Jerry J., to Hughes Aircraft Company. One-time-close relay useful in spacecraft power systems. 5,025,119, Cl. 200-262.000.

Rogowski, Dirk: *See—*
Friederich, Kilian; and Rogowski, Dirk, 5,024,977, Cl. 501-91.000.

Rohde & Schwarz GmbH & Co KG: *See—*
Danzeisen, Klaus, 5,025,208, Cl. 324-77.00R.

Rohe, Clair F.: *See—*
Dinan, Raymond F.; Fallon, Hugh C.; Malin, Jerald R.; Rodite, Robert R.; Rohe, Clair F.; and Rohrer, Gene D., 5,025,483, Cl. 382-58.000.

Rohm GmbH Chemische Fabrik: *See—*
Eich, Manfred; and Wendorff, Joachim, 5,024,784, Cl. 252-299.010.

Rohrbaugh, George W. Shock wave scoring apparatus employing curved rod sensors. 5,025,424, Cl. 367-127.000.

Rohrer, Gene D.: *See—*
Dinan, Raymond F.; Fallon, Hugh C.; Malin, Jerald R.; Rodite, Robert R.; Rohe, Clair F.; and Rohrer, Gene D., 5,025,483, Cl. 382-58.000.

Rohrer, George A.; and McMillin, Larry D., to Ramtron Corporation. Method of making ferroelectric memory devices. 5,024,964, Cl. 437-47.000.

Roizen, Michael; Turcotte, William E., II; and Pfisterer, Richard E., to ARCH Development Corp. Portable system for choosing pre-operative patient test. 5,025,374, Cl. 364-413.020.

Rolls-Royce plc: *See*—
Olive, Clive E., 5,024,580, Cl. 415-150.000.
Roman, Lorand J. Stamp and envelope moistener. 5,024,180, Cl. 118-244.000.
Romero, Ervin G.: *See*—
Pease, George E., Jr.; Romero, Ervin G.; and Glasenapp, Rudi K. H., 5,024,491, Cl. 303-93.000.
Romero, Hugo; and Anderson, Robert, to Medical Laboratory Automation, Inc. Method and apparatus for performing hydrostatic correction in a pipette. 5,024,109, Cl. 73-864.160.
Roobeek, Cornelis F.: *See*—
van Leeuwen, Petrus W. N. M.; and Roobeek, Cornelis F., 5,025,091, Cl. 528-392.000.
Roovers, Wilhemus M. M.: *See*—
Hamersma, Wilhelmus J. L. A.; Kempers, Torben P.; and Roovers, Wilhemus M. M., 5,025,055, Cl. 524-269.000.
Rosal, Enrique R.: *See*—
Wilson, John F.; Rosal, Enrique R.; and Bucher, George D., 5,024,574, Cl. 414-416.000.
Rose, Robert C.: *See*—
Seiler, Larry D.; Pappas, James L.; and Rose, Robert C., 5,025,249, Cl. 340-721.000.
Rose, William: *See*—
Pape, Robert; Rose, William; Burgel, Frank; and Adams, Chip, 5,023,996, Cl. 30-144.000.
Rosenau, Mark A.: *See*—
Johary, Arun; and Rosenau, Mark A., 5,025,315, Cl. 358-140.000.
Rosenbaum, Nolan G.: *See*—
Haines, John G.; Rosenbaum, Nolan G.; Pion, Albert L.; Lecarpentier, Marc; Henriot, Christophe; and Abumehdi, Cyrus, 5,025,383, Cl. 364-464.030.
Rosenbluh, Michael: *See*—
Freund, Isaac; and Rosenbluh, Michael, 5,024,528, Cl. 356-356.000.
Rosenstein, Alexander D. Method and apparatus for determining osseous implant fixation integrity. 5,024,239, Cl. 128-774.000.
Roser, Georges, to Sotralentz S. A. Container for storing and transporting a liquid with a deformable liner which assists drainage. 5,024,346, Cl. 220-401.000.
Ross, Jeffrey A., to Warner & Swasey Company, The. Circuit and process for converting a half bridge transducer output signal to an LVDT transducer output signal. 5,025,214, Cl. 324-207.190.
Ross, Robert J.: *See*—
Pellerin, Roy F.; and Ross, Robert J., 5,024,091, Cl. 73-597.000.
Rothstein, David M.; Love, Susan F.; and Baum, Ellen Z., to American Cyanamid Company. Genetic system for micromonospora. 5,024,948, Cl. 435-252.100.
Rottmann, Dieter: *See*—
Klank, Otto; and Rottmann, Dieter, 5,025,406, Cl. 364-724.190.
Rotzin, Stephen A. Aerodynamic bicycle helmet. 5,023,958, Cl. 2-411.000.
Rousseau, Claude. Golfcourse simulator device. 5,024,441, Cl. 273-176.00R.
Roussel Uclaf: *See*—
Demoute, Jean-Pierre; Touyer, Gaetan; and Mouren, Michel, 5,024,828, Cl. 424-1.100.
Rubbermaid Incorporated: *See*—
Kahl, W. Henry; Price, David E.; and Tsao, Nai-Cheng, 5,024,471, Cl. 292-97.000.
Rudy, Randy T.: *See*—
Groenendaal, John C., Jr.; and Rudy, Randy T., 5,024,579, Cl. 415-108.000.
Rusiniak, Richard J.: *See*—
Cheadle, Brian E.; and Rusiniak, Richard J., 5,024,268, Cl. 165-134.100.
Rusken Machine & Tool Service: *See*—
Lloyd, Russell M., 5,024,073, Cl. 70-491.000.
Russell, Donald L., to B. F. Goodrich Company, The. Torque transmitting beam for wheel having brake torque drives. 5,024,297, Cl. 188-18.00A.
Rust, Mark H.; and Kramer, Brian J. Spinner bait lure with rattle pod. 5,024,019, Cl. 43-42.310.
Rutschle, Eugen: *See*—
Winkler, Hans-Henning; and Rutschle, Eugen, 5,023,983, Cl. 29-27.00R.
Ryan, Thomas J., to Alusuisse-Lonza Services Ltd. Apparatus and method for degassing molten metal. 5,024,696, Cl. 75-708.000.
Ryba, Jiri: *See*—
Simecek, Cyril; and Ryba, Jiri, 5,024,233, Cl. 128-659.000.
Ryobi Motor Products Corp.: *See*—
Looper, Timothy J.; and Sistare, James R., 5,023,999, Cl. 30-390.000.
Ryu, Yasunori: *See*—
Tanaka, Nobuhiro; Hirata, Eiji; Moriguchi, Hideyuki; Azekura, Ko; Tsubone, Akira; and Ryu, Yasunori, 5,024,572, Cl. 414-276.000.
S&C Electric Company: *See*—
Fanta, Thomas O.; and Chabala, Leonard V., 5,025,171, Cl. 307-150.000.
Sacks, William: *See*—
Mason, Charles D.; Sacks, William; Engelmann, Theodore R.; and Verma, Satyajit, 5,024,897, Cl. 428-474.400.
Saeki, Kiyoshi; Ohtsuki, Toshinori; and Ueno, Kazuo, to Matsushita Electric Industrial Co., Ltd. Color electrostatic recording apparatus. 5,025,269, Cl. 346-108.000.
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Nagato, Shoin; Taguchi, Ryusuke; Hirai, Kenji; Hirose, Hiroaki; and Yokota, Masahiro, 5,024,692, Cl. 71-86.000.
Saijo, Hiroyuki: *See*—
Deguchi, Katsuhiko; Saito, Kozo; Saijo, Hiroyuki; and Tosaka, Masaki, 5,025,069, Cl. 252-174.170.
Sainburg, Frank P.: *See*—
Eckerle, Douglas W.; and Sainburg, Frank P., 5,024,611, Cl. 446-268.000.
Saito, Itaru: *See*—
Matsubara, Ken; Saito, Itaru; Kitano, Hirohisa; Shingaki, Kouichi; and Masuda, Tomohiko, 5,024,511, Cl. 350-356.000.
Saito, Kouichi: *See*—
Kubo, Nami; Yoshioka, Toshio; Saito, Kouichi; and Tohyama, Syunroku, 5,024,767, Cl. 210-682.000.
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Terada, Masayuki; Saito, Shinji; and Miura, Asahiko, 5,024,908, Cl. 429-245.000.
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Arimoto, Akira; Saito, Susumu; Tsunoda, Yoshito; Moriyama, Shigeo; and Mochizuki, Takeshi, 5,025,268, Cl. 346-108.000.
Saito, Yasuo; Fujimoto, Seiji; Nobuta, Yasuo; and Yamazaki, Masahiko, to Kabushiki Kaisha Toshiba. X-ray detector having function of compensating for sensitivity of scintillator. 5,025,462, Cl. 378-19.000.
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Saitoh, Tadashi: *See*—
Uematsu, Tsuyoshi; and Saitoh, Tadashi, 5,024,953, Cl. 437-2.000.
Saitoh, Takashi, to Nagano Technical Service Co., Ltd.; and Technical Products Co., Ltd. Method and apparatus for storing flat-folded cases in a pile, and for opening and sealing said cases. 5,024,640, Cl. 493-127.000.
Sakai, Akiyoshi: *See*—
Yonezawa, Yasuo; Ohnishi, Toshiya; Okumura, Shin-ichi; Sakai, Akiyoshi; Nakano, Hiroki; Matsushita, Masao; Morikawa, Atsushi; and Yoshihara, Motoshi, 5,024,064, Cl. 62-106.000.
Sakai, Hideko: *See*—
Kishiro, Osamu; Kamata, Hiroshi; and Sakai, Hideko, 5,025,082, Cl. 528-190.000.
Sakai, Kazuhiro: *See*—
Tsunashima, Makoto; Uchida, Hiroto; Sakai, Kazuhiro; and Miyauchi, Masato, 5,024,991, Cl. 505-1.000.
Sakai, Yoshihisa: *See*—
Sudo, Shoichi; Sakai, Yoshihisa; Yasaka, Hiroshi; Ikegami, Tetsuhiko; Yoshikuni, Yuzo; Yokohama, Itaru; and Kubodera, Kenichi, 5,025,448, Cl. 372-32.000.
Sakakibara, Shiro; Hasebe, Masahiro; and Hattori, Masashi, to Aisin AW Co., Ltd. Actuator for a frictional engaging device. 5,024,638, Cl. 475-210.000.
Sakashita, Mitsuaki: *See*—
Fujikawa, Yoshihiro; Suzuki, Mikio; Iwasaki, Hiroshi; Sakashita, Mitsuaki; and Kirahara, Masaki, 5,024,999, Cl. 514-63.000.
Sakata, Haruyasu: *See*—
Tateishi, Kiyoshi; Sakata, Haruyasu; Tawaragi, Yuji; Suzuki, Masanori; and Ohie, Takayuki, 5,025,434, Cl. 369-44.360.
Sakayori, Hiroyuki: *See*—
Watanabe, Toshio; Sato, Masahiko; Osabe, Akio; Sakayori, Hiroyuki; and Mase, Akira, 5,024,255, Cl. 141-11.000.
Sakurai, Einosuke: *See*—
Miura, Katsutoshi; Koyama, Hiroyasu; Sugai, Toshiji; Yamada, Hiroaki; and Sakurai, Einosuke, 5,025,012, Cl. 514-252.000.
Sakurai, Toshiharu: *See*—
Shindo, Masamichi; Sakurai, Toshiharu; Taguchi, Hideo; and Izawa, Nobu, 5,025,347, Cl. 361-386.000.
Salaun, Jacques: *See*—
Savin, Antoine; and Salaun, Jacques, 5,024,604, Cl. 439-345.000.
Salemink, Johannes H. A. G.: *See*—
Hulsman, Severien; and Salemink, Johannes H. A. G., 5,024,241, Cl. 131-84.200.
Sales, Veronique: *See*—
Patoiseau, Jean F.; Autin, Jean-Marie; Cousse, Henri; Sales, Veronique; Tisne-Versailles, Jacky; and Bali, Jean-Pierre, 5,025,015, Cl. 514-274.000.
Salo, Jukka; and Lehtonen, Pentti, to Valmet Paper Machinery Inc. Coated roll for a paper making machine. 5,023,985, Cl. 29-132.000.
Salomon, Mary F., to Lubrizol Corporation, The. Nitrogen containing anti-oxidant compositions. 5,024,774, Cl. 252-47.000.
Salomon S. A.: *See*—
DuFour, Pierre, 5,024,007, Cl. 36-127.000.
Saluja, Raja; and Nagare, Arthur T., to American Sterilizer Company. Counterbalanced arm for a lighthead. 5,025,359, Cl. 362-402.000.
Salvi, Jean-Francois, to Sipel Electronics S.A. Pair of nippers. 5,023,997, Cl. 30-175.000.
Salzmann, Thomas N.: *See*—
Dininno, Frank P.; and Salzmann, Thomas N., 5,025,006, Cl. 514-210.000.
DiNinno, Frank P.; Salzmann, Thomas N.; and Greenlee, Mark L., 5,025,008, Cl. 514-210.000.
Samsung Electron Devices Co., Ltd.: *See*—
Son, Wan-jae, 5,025,189, Cl. 313-414.000.
SamSung Electronics Co., Ltd.: *See*—
Lee, Hyo-Sam, 5,025,308, Cl. 358-10.000.

SamSung Semiconductor and Telecommunication Co. Ltd.: *See*—
Kim, Heung S.; and Myung, Chan K., 5,025,180, Cl. 307-475.000.
Sanada, Masaru: *See*—
Kitamura, Shigeharu; Nakamura, Haruhiko; and Sanada, Masaru, 5,024,314, Cl. 198-333.000.
Sanchez, Mary M. Maternity and nursing brassiere with strap variations. 5,024,628, Cl. 450-36.000.
Sandel, Dan; Horan, Robert T.; Gaba, Rodolfo; and Ramirez, Bruno J., to Devon Industries, Inc. Medical instrument holder and sharps disposal container. 5,024,326, Cl. 206-366.000.
Sanden Coporation: *See*—
Miyazawa, Tadashi, 5,024,313, Cl. 194-217.000.
Sanders Associates, Inc.: *See*—
Bauman, Ralph E.; and Seymour, Horace W., III, 5,024,623, Cl. 439-876.000.
Sanderson, John R.; Marquis, Edward T.; and Knifton, John F., to Texaco Chemical Company. Purification of cumene recycle streams. 5,025,112, Cl. 585-852.000.
Sanderson, John R.; and Knifton, John F., to Texaco Chemical Company. Catalytic preparation of tertiary butyl alcohol from tertiary butyl hydroperoxide. 5,025,113, Cl. 568-909.800.
Sanderson, Paul H.; and Serkland, Richard C. Aircraft armament apparatus. 5,024,138, Cl. 89-37.220.
Sandler, Stanley R., to Atochem North America, Inc. 2,4-pentanedione-1-sulfonic acid and method for preparing the same. 5,025,104, Cl. 562-109.000.
Sandoz Ltd.: *See*—
Farrar, John M.; and Graham, Mark D., 5,024,786, Cl. 252-543.000.
Sandstrom, Richard L.: *See*—
Anderson, Stuart L.; and Sandstrom, Richard L., 5,025,445, Cl. 372-20.000.
Sanjana, Zal N.: *See*—
Harrold, Ronald T.; and Sanjana, Zal N., 5,024,092, Cl. 73-602.000.
Sanshin Kogyo Kabushiki Kaisha: *See*—
Kameyama, Takuma, 5,024,190, Cl. 123-196.00R.
Santanam, Chandran B.; Thomas, William H.; and DeJulio, Emil R., to General Motors Corporation. External combustor for gas turbine engine. 5,024,170, Cl. 110-264.000.
Santangelo, Francesco: *See*—
Casagrande, Cesare; Montanari, Stefania; and Santangelo, Francesco, 5,025,011, Cl. 514-234.200.
Santel, Hans-Joachim: *See*—
Schallner, Otto; Negele, Michael; Santel, Hans-Joachim; Lurssen, Klaus; Schmidt, Robert R.; and Krauskopf, Birgit, 5,024,694, Cl. 71-95.000.
Santoh, Tsuyoshi: *See*—
Mihara, Chieko; Santoh, Tsuyoshi; and Sugata, Hiroyuki, 5,024,917, Cl. 430-271.000.
Sanyo Electric Co., Ltd.: *See*—
Hirono, Yutaka; Kiyama, Seiichi; and Osumi, Masato, 5,024,724, Cl. 156-643.000.
Tsuchida, Takefumi; Yoshida, Minoru; Kodama, Yoshimi; and Moriyama, Masahiro, 5,025,332, Cl. 360-85.000.
Tsuchida, Yasuyuki; and Nakanishi, Yuki, 5,023,973, Cl. 15-319.000.
Sariscak, Robert E.: *See*—
Impink, Albert J., Jr.; Grobmyer, Louis R.; Sariscak, Robert E.; Morita, Toshio; and Duryea, John L., 5,024,801, Cl. 376-217.000.
Sarubbi, Thomas R.: *See*—
Blakeney, Andrew J.; Jeffries, Alfred T., III; and Sarubbi, Thomas R., 5,024,921, Cl. 430-326.000.
Sasaki, Katsumi: *See*—
Suda, Hirohisa; Sasaki, Katsumi; and Osato, Yasukuni, 5,024,363, Cl. 225-96.005.
Sasaki, Michiaki; and Yuki, Kazuya, to Nissan Motor Co., Ltd. Jet pump structure for a fuel tank. 5,024,583, Cl. 417-198.000.
Sasaki, Shigeo: *See*—
Okuda, Soichiro; Nakanishi, Tetsuya; Sasaki, Shigeo; and Noguchi, Kazuhiko, 5,025,167, Cl. 250-492.200.
Sasaki, Souji; Kino, Hirotoshi; Musha, Yoshinori; Kubota, Jun; and Okada, Hisao, to Hitachi, Ltd. Fan-shape scanning ultrasonic flaw detecting apparatus. 5,024,093, Cl. 73-633.000.
Sassoon, Ezra: *See*—
Bennett, Robert B.; Hung, Vincent; and Sassoon, Ezra, 5,023,979, Cl. 24-68.00R.
Sato, Isao; Kirikami, Seiichi; Shimura, Akira; Hirose, Fumiyuki; Inose, Hiroshi; Urushidani, Haruo; and Arai, Osamu, to Hitachi, Ltd. Device for detecting combustion conditions in combustors. 5,024,055, Cl. 60-39.270.
Sato, Katsuhiro: *See*—
Akasaki, Yutaka; Aonuma, Hidekazu; Nukada, Katsumi; Tokita, Akihiko; Suto, Hidemi; Sato, Katsuhiro; and Tanaka, Hiroyuki, 5,024,911, Cl. 430-58.000.
Sato, Kazue: *See*—
Tanaka, Tsuneo; Sato, Kazue; Takewa, Hiroyuki; Kurozuka, Akira; Tamura, Tadashi; Hattori, Katsuji; Takayama, Satoshi; Murata, Kosaku; Satoh, Katsuaki; Serikawa, Mituhiko; Kimura, Youichi; and Obata, Shuichi, 5,025,474, Cl. 381-90.000.
Sato, Kazuharu: *See*—
Takarada, Mitsuhiro; and Sato, Kazuharu, 5,025,049, Cl. 524-91.000.
Sato, Kunihito: *See*—
Kokubo, Kouichi; Hamada, Toshiaki; Tagawa, Shinichi; Suzumura, Nobuyasu; Buma, Shuuichi; Aburaya, Toshio; Onuma, Toshio; Sato, Kunihito; Yonekawa, Takashi; Kawanishi, Masaki; Ikemoto, Hiroyuki; and Ohashi, Kaoru, 5,024,459, Cl. 280-707.000.
Sato, Masahiko: *See*—
Watanabe, Toshio; Sato, Masahiko; Osabe, Akio; Sakayori, Hiroyuki; and Mase, Akira, 5,024,255, Cl. 141-11.000.
Sato, Masanori: *See*—
Ozawa, Kazuo; and Sato, Masanori, 5,024,394, Cl. 242-198.000.
Sato, Takeo: *See*—
Aoki, Shinichiro; Sato, Takeo; Yamaguchi, Katsumasa; and Yamamoto, Masaki, 5,025,168, Cl. 250-548.000.
Sato, Yasue, to Canon Kabushiki Kaisha. Plasma processing apparatus for etching, ashing and film-formation. 5,024,716, Cl. 156-345.000.
Sato, Yoshinori; and Akamine, Hiroshi, to Ferro Corporation. Synthetic resin composition. 5,025,051, Cl. 524-99.000.
Sato, Yukou; and Kukimoto, Tsutomu, to Canon Kabushiki Kaisha. Positively chargeable developer. 5,024,915, Cl. 430-110.000.
Satoh, Katsuaki: *See*—
Tanaka, Tsuneo; Sato, Kazue; Takewa, Hiroyuki; Kurozuka, Akira; Tamura, Tadashi; Hattori, Katsuji; Takayama, Satoshi; Murata, Kosaku; Satoh, Katsuaki; Serikawa, Mituhiko; Kimura, Youichi; and Obata, Shuichi, 5,025,474, Cl. 381-90.000.
Sauerberg, Per: *See*—
Rapoport, Henry; and Sauerberg, Per, 5,025,027, Cl. 514-376.000.
Savin, Antoine; and Salaun, Jacques, to Carrier Kheops Bac. No-load breakable electrical contact especially for connected appliances or vehicles. 5,024,604, Cl. 439-345.000.
Savin Corporation: *See*—
Landa, Benzion; Krumberg, Yakov; and Adam, Yossef, 5,025,290, Cl. 355-265.000.
Sayegh, Emile G.; Vana, James G., Jr.; and Willey, Wendall D., to W. L. Gore & Associates, Inc. Insulated power cables. 5,025,115, Cl. 174-117.00F.
Scally, Charles R.: *See*—
Carr, Daniel J.; and Scally, Charles R., 5,025,265, Cl. 346-1.100.
Scata, Mario; and Passero, Adolfo, to Meccanizzazione Postale E Automazione SpA. Sorting unit for belt conveyor systems. 5,024,316, Cl. 198-369.000.
Schafer, Ralf: *See*—
Ganser, Hans G.; Schafer, Ralf; and Stormberg, Hans P., 5,025,197, Cl. 315-172.000.
Schaffer, Leslie E.: *See*—
Garg, Diwakar; Dyer, Paul N.; Schaffer, Leslie E.; Wrecsics, Ernest L.; Dimos, Duane; and Mueller, Carl F., 5,024,901, Cl. 428-627.000.
Schallner, Otto; Negele, Michael; Santel, Hans-Joachim; Lurssen, Klaus; Schmidt, Robert R.; and Krauskopf, Birgit, to Bayer Aktiengesellschaft. Herbicidal N-aryl nitrogen heterocycles having fluorine-containing substituents. 5,024,694, Cl. 71-95.000.
Schaupert, Kurt, to Schott Glaswerke. Gas cooking appliance with at least one radiant gas burner arranged underneath a glass ceramic plate, as well as process for reducing the heating-up time of such a gas cooking appliance. 5,024,209, Cl. 126-39.00H.
Schenk, Donald E.; DeHoff, Edward J.; and Shaw, Schuyler S., to General Motors Corporation. Apparatus and method of automotive brake with booster piston. 5,024,298, Cl. 188-72.200.
Schenk, Donald E.: *See*—
Miller, Jon E.; and Schenk, Donald E., 5,024,300, Cl. 188-264.0CC.
Shaw, Schuyler S.; Hallinan, Linda L.; Hammersmith, Robert J.; Schenk, Donald E.; DeHoff, Edward J.; and Kade, Alexander, 5,024,299, Cl. 188-156.000.
Schenkel, Howard M., to Sensormatic Electronics Corporation. EAS tag with motion detection facility. 5,025,246, Cl. 340-572.000.
Schering Agrochemicals Ltd.: *See*—
Gates, Peter S.; and Jones, Graham P., 5,024,693, Cl. 71-92.000.
Schering Aktiengesellschaft: *See*—
Hubel, Egon, 5,024,732, Cl. 204-1.110.
Schering Corporation: *See*—
Horan, Ann C, 5,024,950, Cl. 435-825.000.
Schettino, Raymond L.: *See*—
Goldstone, Andrew C.; and Schettino, Raymond L., 5,024,228, Cl. 128-642.000.
Schickaneder, Helmut: *See*—
Ahrens, Kurt H.; Schickaneder, Helmut; Engler, Heidrun; and Szeleny, Istvan, 5,025,016, Cl. 514-274.000.
Schifter, Stephan C.: *See*—
DiLullo, Joseph V.; Schifter, Stephan C.; Negin, Michael; and Paist, Kenneth W., 5,025,253, Cl. 340-825.060.
Schlaginhaufen, Arthur, to Arthur Schlaginhaufen Ing. Filtering apparatus. 5,024,763, Cl. 210-333.010.
Schlumberger Industries Limited: *See*—
Dames, Andrew N., 5,024,104, Cl. 73-861.370.
Reichert, Ricardo H.; and Reichert, Alberto J., 5,024,358, Cl. 224-35.000.
Schlumberger Technology Corporation: *See*—
Melcher, Charles L., 5,025,151, Cl. 250-269.000.
Petitjean, Luc; and Valdois, Michel, 5,024,098, Cl. 73-729.000.
Schmid, Eckhardt: *See*—
Bauer, Kurt; and Schmid, Eckhardt, 5,023,972, Cl. 15-250.420.
Schmid, Walter, to ARBO Medizin-Technologie GmbH. Bioelectrical electrode. 5,024,227, Cl. 128-640.000.
Schmidt, Michael R., to General Motors Corporation. Hydromechanical transmission with adjunct flywheel. 5,024,633, Cl. 475-72.000.
Schmidt, Oskar; and Grunner, Erich, to Lim Kunststoff Technologie Gesellschaft m.b.H. Tire-making method. 5,024,800, Cl. 264-502.000.
Schmidt, Robert R.: *See*—
Schallner, Otto; Negele, Michael; Santel, Hans-Joachim; Lurssen, Klaus; Schmidt, Robert R.; and Krauskopf, Birgit, 5,024,694, Cl. 71-95.000.

Schniederjan, Reinhold, to Hydromatik GmbH. Swashplate type hydraulic axial piston machine having a tracking device for the cage of the segmental rolling contact bearing of the swashplate. 5,024,143, Cl. 92-12.200.
Schoen, Klaus-Peter: *See*—
Urban, Rudolf; Fritsch, Josef; and Schoen, Klaus-Peter, 5,024,041, Cl. 53-449.000.
Schoeneberger, Ernest A.: *See*—
Glass, Emmett F.; Schoeneberger, Ernest A.; and Makofka, Stanley J., 5,024,051, Cl. 56-297.000.
Schofield, Harold D.; and Caron, Paul R., to DataCard Corporation. Thermal print head termperature control. 5,025,267, Cl. 346-1.100.
Scholkens, Bernward: *See*—
Oekonomopulos, Raymond; Henning, Rainer; Lerch, Ulrich; Scholkens, Bernward; and Linz, Wolfgang, 5,025,010, Cl. 514-224.200.
Schoppe, Dwaine W.: *See*—
Claus, Kenneth G.; Schoppe, Dwaine W.; and Earlam, Matthew R., 5,024,737, Cl. 204-71.000.
Schorman, Eric R.: *See*—
Lynk, Charles N.; and Schorman, Eric R., 5,025,442, Cl. 370-29.000.
Schott Glaswerke: *See*—
Schaupert, Kurt, 5,024,209, Cl. 126-39.00H.
Schrader, William A.: *See*—
Phebus, Dan E.; Schrader, William A.; and Summers, Russell E., Jr., 5,024,636, Cl. 475-141.000.
Schrecongost, Ray B. Luggage cart. 5,024,455, Cl. 280-37.000.
Schroeder, Jon M. Fuel assisted electromagnetic launcher. 5,024,137, Cl. 89-8.000.
Schrors, Gunter: *See*—
Brendel, Berhard; and Schrors, Gunter, 5,024,150, Cl. 100-35.000.
Schubert, Erdmann F.: *See*—
Kopf, Rose F.; Kuo, J. M.; Luftman, Henry S.; and Schubert, Erdmann F., 5,024,967, Cl. 437-95.000.
Schubert, Peter: *See*—
Koberstein, Edgar; Engler, Bernd; Domesle, Rainer; and Schubert, Peter, 5,024,985, Cl. 502-304.000.
Schultze, Wolfgang: *See*—
Ley, Gregor; Schultze, Wolfgang; Vinke, Johannes; and Wistuba, Eckehardt, 5,025,062, Cl. 524-556.000.
Schumacher, David B.; and Bakowski, Steven J., to Snyder General Corporation. Furnace protective device. 5,024,595, Cl. 431-18.000.
Schumacher, Elaine F.: *See*—
Zupancic, Joseph J.; Swedo, Raymond J.; Jamieson, Donald R.; Schumacher, Elaine F.; and Buehler, Allyson J., 5,025,079, Cl. 528-170.000.
Schwab, Carl M., Jr., to Otis Engineering Corp. Method and apparatus for enhanced oil recovery. 5,024,274, Cl. 166-303.000.
Schwartz, David J., to David Schwartz Enterprises, Inc. Computer system. 5,025,369, Cl. 364-200.000.
Schwartz, Russell J.; and Gregorio, Manuel Z., to Sun Chemical Corporation. Monoazo pigment compositions. 5,024,698, Cl. 106-20.000.
Schwartzbach, Bjarne, to U.S. Philips Corp. Temperature-controlled crystal oscillator circuit. 5,025,231, Cl. 331-116.00R.
Schwarz, Robert C., to Grumman Aerospace Corporation. Apparatus and method for shadow moire mapping. 5,025,285, Cl. 355-77.000.
Schwarze, Ralph W.; and Dickson, Thomas D., Jr. Conveyor storage apparatus. 5,024,318, Cl. 198-465.200.
Schwerdt, Hans-Werner, to Carl Freudenberg, Firma. Elastomeric sleeve spring. 5,024,425, Cl. 267-140.100.
Scientific-Atlanta, Inc.: *See*—
Cook, James, Jr., 5,025,493, Cl. 342-374.000.
Scott, Bentley N.; and Shortes, Samuel R., to Phase Dynamics, Inc. System and method for monitoring substances and reactions. 5,025,222, Cl. 324-639.000.
Scott, Brian L.; Smith, Lloyd A.; Newell, J. Mark; Balentine, Bruce E.; and Lin, Lisan S., to Scott Instruments Corporation. Method and apparatus for extracting information-bearing portions of a signal for recognizing varying instances of similar patterns. 5,025,471, Cl. 381-43.000.
Scott Instruments Corporation: *See*—
Scott, Brian L.; Smith, Lloyd A.; Newell, J. Mark; Balentine, Bruce E.; and Lin, Lisan S., 5,025,471, Cl. 381-43.000.
Seaford Nominees Pty. Ltd.: *See*—
Stewart, Peter J., 5,024,005, Cl. 34-164.000.
Sealed Power Technologies, L.P.: *See*—
Hill, Stephen H., 5,024,203, Cl. 123-573.000.
Sechi, Franco N.: *See*—
Bujatti, Marina; and Sechi, Franco N., 5,023,994, Cl. 29-852.000.
Secura Corporation: *See*—
DiLullo, Joseph V.; Schifter, Stephan C.; Negin, Michael; and Paist, Kenneth W., 5,025,253, Cl. 340-825.060.
Seely, Warren L.: *See*—
Fullerton, Craig L.; and Seely, Warren L., 5,025,296, Cl. 357-23.800.
Seibu Electric & Machinery Co., Ltd.: *See*—
Tanaka, Nobuhiro; Hirata, Eiji; Moriguchi, Hideyuki; Azekura, Ko; Tsubone, Akira; and Ryu, Yasunori, 5,024,572, Cl. 414-276.000.
Seidel, Hans: *See*—
Mayr, Ulrich; Gauhl, Helmgard; and Seidel, Hans, 5,024,945, Cl. 435-191.000.
Seidman, Jonathan: *See*—
Brenner, Michael B.; Strominger, Jack L.; Seidman, Jonathan; Ip, Stephen H.; and Krangel, Micahel S., 5,024,940, Cl. 435-69.100.
Seidner, Leonard. Monovision corneal contact lenses. 5,024,517, Cl. 351-161.000.
Seiko Epson Corporation: *See*—
Mitsuishi, Akio; Takeuchi, Takashi; and Koshiishi, Osamu, 5,024,543, Cl. 400-124.000.
Tanaka, Minoru, 5,024,542, Cl. 400-124.000.
Seiko Instruments, Inc.: *See*—
Morita, Yoshiyuki, 5,025,410, Cl. 364-900.000.
Tsukada, Nobuo, 5,025,186, Cl. 310-323.000.
Umezawa, Kazuhisa, 5,025,270, Cl. 346-140.00R.
Seiko Seiki Kabushiki Kaisha: *See*—
Kihara, Hiroyuki; and Omori, Hideki, 5,024,025, Cl. 51-165.770.
Seikosha Co., Ltd.: *See*—
Watanabe, Isato, 5,025,429, Cl. 368-238.000.
Seiler, Larry D.; Pappas, James L.; and Rose, Robert C., to Digital Equipment Corporation. Pixel lookup in multiple variably-sized hardware virtual colormaps in a computer video graphics system. 5,025,249, Cl. 340-721.000.
Seki, Masaki; Takegahara, Takashi; and Nakajima, Masatoshi, to Fanuc Ltd. Automatic programming method. 5,025,363, Cl. 364-191.000.
Seki, Nobuyoshi; Morii, Nobuyuki; Sugiyama, Yoshihide; Komada, Takashi; Hosoi, Masatoshi; Hujiwara, Atuhisa; Ichinose, Tsutomu; Mori, Goro; Kikuchi, Toshiyuki; and Minato, Masahiro, to Ricoh Company, Ltd. Paper handling apparatus. 5,024,430, Cl. 270-53.000.
Seki, Reiji: *See*—
Ishimura, Toshihiko; Okuno, Akira; Tanii, Junichi; and Seki, Reiji, 5,025,239, Cl. 335-265.000.
Seki, Yasukazu, to Fuji Electric Co., Ltd. Conductivity modulation type MOSFET. 5,025,293, Cl. 357-23.400.
Sekine, Shuji; and Harada, Naoto, to Jidoshi Denki Kogyo K.K. Small-sized electric motor. 5,025,184, Cl. 310-71.000.
Sekiya, Hiroshi; Kurita, Toshiyuki; Nakagaki, Nobufumi; and Murata, Toshinori, to Hitachi, Ltd.; and Hitachi Video Engineering, Inc. Clock pulse generator capable of being switched to process both standard and non-standard television signals. 5,025,310, Cl. 358-19.000.
Sekiya, Yoshiki: *See*—
Shinzawa, Motohiro; and Sekiya, Yoshiki, 5,024,194, Cl. 123-269.000.
Selby, Howard W., III, to Selsys Corporation. Locking cam latch mechanism. 5,024,474, Cl. 292-252.000.
Selsys Corporation: *See*—
Selby, Howard W., III, 5,024,474, Cl. 292-252.000.
SEM AB: *See*—
Agren, Nils A., 5,025,498, Cl. 361-156.000.
Semiconductor Energy Laboratory Co., Ltd.: *See*—
Watanabe, Toshio; Sato, Masahiko; Osabe, Akio; Sakayori, Hiroyuki; and Mase, Akira, 5,024,255, Cl. 141-11.000.
Semmler, Peter: *See*—
Gast, Eduard; and Semmler, Peter, 5,024,708, Cl. 149-19.100.
Senda, Shuji: *See*—
Omata, Tetsuo; Senda, Shuji; Tanaka, Tamaki; Kumagai, Eriko; Kajimoto, Chikara; and Nakazono, Yutaka, 5,024,832, Cl. 424-84.000.
Senoo, Atsuyoshi, to Furukawa Electric Co., Ltd., The. Flame-resistant non-drying putty composition. 5,025,058, Cl. 524-436.000.
Sensormatic Electronics Corporation: *See*—
Schenkel, Howard M., 5,025,246, Cl. 340-572.000.
Sergant, Moshe: *See*—
Jansen, Michael; Sergant, Moshe; Ou, Szutsun S.; Wilcox, Jaroslava Z.; Yang, Jane J.; and Eaton, Larry R., 5,025,451, Cl. 372-50.000.
Serikawa, Mituhiko: *See*—
Tanaka, Tsuneo; Sato, Kazue; Takewa, Hiroyuki; Kurozuka, Akira; Tamura, Tadashi; Hattori, Katsuji; Takayama, Satoshi; Murata, Kosaku; Satoh, Katsuaki; Serikawa, Mituhiko; Kimura, Youichi; and Obata, Shuichi, 5,025,474, Cl. 381-90.000.
Serkland, Richard C.: *See*—
Sanderson, Paul H.; and Serkland, Richard C., 5,024,138, Cl. 89-37.220.
Serve, Philippe, to Societe Industrielle de Plastiques en abrege "Sipla". Package for grouped articles. 5,024,330, Cl. 206-486.000.
Servens, Christian: *See*—
Debaig-Valade, Caroline; Filliatre, Claude; and Servens, Christian, 5,024,979, Cl. 501-95.000.
Setra Systems, Inc.: *See*—
Lee, Shih-Ying, 5,024,099, Cl. 73-730.000.
Sewell Plastics, Inc.: *See*—
Alberghini, Alfred C.; Brunson, David A.; and Lynn, Stephen R., 5,024,340, Cl. 215-1.00C.
Seymour, Horace W., III: *See*—
Bauman, Ralph E.; and Seymour, Horace W., III, 5,024,623, Cl. 439-876.000.
Shafirkin, David I. Coding assembly for locklike devices. 5,024,071, Cl. 70-387.000.
Shah, Dipak J.: *See*—
Buchholz, Robert L.; Grald, Eric W.; Nelson, Lorne W.; and Shah, Dipak J., 5,024,265, Cl. 165-22.000.
Shahar, Gabriel: *See*—
Shahar, Moshe; and Shahar, Gabriel, 5,024,571, Cl. 414-231.000.
Shahar, Moshe; and Shahar, Gabriel. Multi-level storage structure. 5,024,571, Cl. 414-231.000.
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Shapiro, Ronald S., to Advanced Medical Technology, Inc. Photoprobe assembly. 5,024,236, Cl. 128-735.000.

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Wu, Stephen H. W.; Greene, Carol J.; and Sharma, Mahendra K., 5,025,004, Cl. 514-165.000.

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Ohta, Tomozo; Nakano, Hiroshi; and Miyazaki, Masao, 5,025,261, Cl. 342-357.000.
Yamamoto, Osamu; and Yoshida, Toshihiko, 5,025,449, Cl. 372-32.000.

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Lewis, Mark L.; Sharples, Thomas D.; and Little, Stephen E., 5,024,646, Cl. 494-16.000.

Shaw, R. H.: *See*—
Turner, Frederick T.; Hutchinson, Martin A.; Shaw, R. H.; and Lamont, Lawrence T., Jr., 5,024,747, Cl. 204-298.090.

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Schenk, Donald E.; DeHoff, Edward J.; and Shaw, Schuyler S., 5,024,298, Cl. 188-72.200.

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Borchardt, John K., 5,024,276, Cl. 166-308.000.
Drent, Eit; and Breed, Anthonius J. M., 5,025,092, Cl. 528-392.000.
Hwo, Charles C.; and Mostert, Simone, 5,024,888, Cl. 428-355.000.
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Morehouse, James H.; Furay, David M.; Blagaila, John; Dion, F. Eugene; Shelstad, Scott A.; and Woods, Jimmy L., 5,025,336, Cl. 360-97.020.

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Stanley, Ian W.; Shepherd, John N.; and Dobson, Peter S., 5,024,500, Cl. 350-96.150.

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Kamigaki, Masaharu; Oshikata, Hironobu; Kawata, Yoshihiro; Shiga, Nobuyasu; Omori, Hideharu; Kawashima, Masayuki; and Shimatani, Toshimichi, 5,025,441, Cl. 370-77.000.

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Kiriseko, Tadashi; Tani, Hiromichi; Soma, Noriko; Shigemi, Nobuhisa; and Toyoda, Takayuki, 5,024,570, Cl. 414-222.000.

Shigemori, Hiromi, to Mitsui Petrochemical Industries, Ltd. 4-methyl-1-pentene polymer compositions. 5,025,057, Cl. 524-423.000.

Shikata, Makoto, to Oki Electric Industry Co., Ltd. Flip-flop circuit. 5,025,174, Cl. 307-272.200.

Shillington, Richard A., to Med-Safe Systems, Inc. Restricted access opening for disposable sharps containers. 5,024,327, Cl. 206-366.000.

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Tanaka, Koji; and Shima, Takashi, 5,024,489, Cl. 303-3.000.

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Ohshima, Masaaki; Kobayashi, Akira; Atsumi, Senji; and Shimada, Hiromi, 5,024,907, Cl. 429-191.000.

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Suganuma, Katsuaki; Fujii, Hiroyuki; Minakuchi, Hiroyoshi; Kada, Katsuhiko; Osafune, Haruo; and Kanamaru, Kuniaki, 5,024,902, Cl. 428-633.000.

Shimamura, Yasuki; and Ihata, Jyoji, to Asahi Kasei Kogyo Kabushiki Kaisha. Photosensitive and heat-sensitive polymers, process for producing the same and process for recording information using the same. 5,025,266, Cl. 346-1.100.

Shimatani, Toshimichi: *See*—
Kamigaki, Masaharu; Oshikata, Hironobu; Kawata, Yoshihiro; Shiga, Nobuyasu; Omori, Hideharu; Kawashima, Masayuki; and Shimatani, Toshimichi, 5,025,441, Cl. 370-77.000.

Shimazu, Kyotaro: *See*—
Morita, Tsuyoshi; Shimazu, Kyotaro; and Furukawa, Masataka, 5,024,728, Cl. 159-27.400.

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Hasegawa, Makoto; Takahashi, Kazuaki; Makimoto, Mitsuo; Takahashi, Masao; and Shimazu, Takayuki, 5,025,229, Cl. 331-107.00A.

Shimizu, Shinji, to Hitachi, Ltd. DRAM which uses MISFETS in the peripheral circuit. 5,025,301, Cl. 357-54.000.

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Shimizu, Tadafumi; and Ohira, Tadashi, to Minolta Camera Kabushiki Kaisha. Sheet transport device with easy sheet jam handling. 5,024,431, Cl. 271-263.000.

Shimizu, Yasushi; and Kawakami, Fukushi, to Yamaha Corporation. Reverberation imparting device. 5,025,472, Cl. 381-63.000.

Shimmyo, Takashi, to Kabushiki Kaisha Toshiba. Facsimile machine using cut sheets as received-signal recording paper and method of feeding the cut-sheets. 5,025,326, Cl. 358-498.000.

Shimomichi, Tsuyoshi: *See*—
Oohashi, Keiji; Araki, Shinji; Suzuki, Hideo; and Shimomichi, Tsuyoshi, 5,024,688, Cl. 65-3.120.

Shimura, Akira: *See*—
Sato, Isao; Kirikami, Seiichi; Shimura, Akira; Hirose, Fumiyuki; Inose, Hiroshi; Urushidani, Haruo; and Arai, Osamu, 5,024,055, Cl. 60-39.270.

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Matsumoto, Fukuji; Tawara, Yoshio; Hayashi, Michio; and Yamada, Osamu, 5,024,423, Cl. 266-283.000.
Takarada, Mitsuhiro; and Sato, Kazuharu, 5,025,049, Cl. 524-91.000.
Tanaka, Masaki; Ohashi, Hiroshi; and Takahashi, Yoshinobu, 5,025,076, Cl. 528-33.000.

Shin-Kobe Electric Machinery Co., Ltd.: *See*—
Terada, Masayuki; Saito, Shinji; and Miura, Asahiko, 5,024,908, Cl. 429-245.000.

Shinada, Hiroko: *See*—
Nakanishi, Masahiro; Mori, Daisuke; Fujii, Katsuyoshi; Hatanaka, Masahiko; and Shinada, Hiroko, 5,024,133, Cl. 84-615.000.

Shindo, Masamichi; Sakurai, Toshiharu; Taguchi, Hideo; and Izawa, Nobu, to Kabushiki Kaisha Toshiba. Semiconductor device. 5,025,347, Cl. 361-386.000.

Shingaki, Kouichi: *See*—
Matsubara, Ken; Saito, Itaru; Kitano, Hirohisa; Shingaki, Kouichi; and Masuda, Tomohiko, 5,024,511, Cl. 350-356.000.

Shinonaga, Hirohiko: *See*—
Takanashi, Itsuo; Nakagaki, Shintaro; Shinonaga, Hirohiko; Asakura, Tsutou; Furuya, Masato; and Tai, Hiromichi, 5,025,209, Cl. 324-96.000.

Shinozaki, Eiichi: *See*—
Suzuki, Satoshi; Kuwabara, Osamu; Muto, Jiro; and Shinozaki, Eiichi, 5,025,348, Cl. 361-398.000.

Shinzawa, Motohiro; and Sekiya, Yoshiki, to Nissan Motor Company, Ltd. of No. 2. Flame dispersion arrangement for swirl chamber type diesel engine piston crown. 5,024,194, Cl. 123-269.000.

Shiono, Katuaki, to Tokyo Eizai Laboratory Co., Ltd. Knee support. 5,024,216, Cl. 128-80.00C.

Shiraki, Masao: *See*—
Kawabata, Susumu; Yoshida, Kazunori; Kisanuki, Yoshikatsu; Suzuki, Hajime; and Shiraki, Masao, 5,024,253, Cl. 139-99.000.

Shirose, Keiichi: *See*—
Kawaguchi, Masaaki; Okamuro, Tomio; and Shirose, Keiichi, 5,024,464, Cl. 280-731.000.

Shoemaker, Stephen P., Jr. Dispensing apparatus. 5,024,350, Cl. 221-75.000.

Shographics, Inc.: *See*—
Sherman, David L., 5,025,408, Cl. 364-759.000.

Shoji, Hisashi; Tamura, Akihiko; Itaya, Masahiko; Fuma, Hiroshi; and Soma, Shinobu, to Konica Corporation. Method for the development of an electrostatic latent image. 5,024,181, Cl. 118-658.000.

Shook, Forrest A.; and Henshaw, Terry L., to NLB Corp. Self-rotating nozzle and method of use. 5,024,382, Cl. 239-11.000.

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Scott, Bentley N.; and Shortes, Samuel R., 5,025,222, Cl. 324-639.000.

Shuknecht, Lee N., to Lee Shuknecht & Sons, Inc. Harvesting machine having blower damage prevention means. 5,024,278, Cl. 171-17.000.

Shyy, Yuh-Yuan: *See*—
Misra, Manjit K.; and Shyy, Yuh-Yuan, 5,024,334, Cl. 209-557.000.

Sica, Gigliola: *See*—
Del Bianco, Sergio; and Sica, Gigliola, 5,024,833, Cl. 424-85.400.

Sidwell, Lloyd G.; and Miller, Conrad E., to Du Pont de Nemours, E. I., and Company. Antistatic lead screens for use with x-ray films. 5,025,164, Cl. 250-483.100.

Siegel, Carole E.: *See*—
Sunshine, Abraham; Laska, Eugene M.; and Siegel, Carole E., 5,025,019, Cl. 514-277.000.

Siemanowski, Werner: *See*—
Jakobson, Gerald; Siemanowski, Werner; and Uhlig, Karl-Heinz, 5,024,787, Cl. 260-410.600.

Siemens Aktiengesellschaft: *See*—
Blaess, Gerhard, 5,025,221, Cl. 324-603.000.
Grohrock, Peter, 5,024,329, Cl. 206-454.000.
Kleinschmidt, Peter; and Mader, Gerhard, 5,025,146, Cl. 250-214.00L.
Kuesters, Karl-Heinz; Mueller, Wolfgang; and Enders, Gerd, 5,025,295, Cl. 357-23.600.
Meinherz, Manfred; Veuhoff, Freidrich-Wilh; Gilmozzi, Gunther; and Kelch, Thomas, 5,025,118, Cl. 200-148.00R.

Siemens Energy & Automation, Inc.: *See*—
Allen, Frankie H.; and Leone, David A., 5,025,121, Cl. 200-275.000.

Siemens Nixdorf Informationssysteme AG: *See*—
Baitz, Guenter; and Behling, Rudolf, 5,025,477, Cl. 382-8.000.

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Morgan, Wayne A., 5,024,221, Cl. 128-419.0PG.
Thacker, James R., 5,024,222, Cl. 128-419.0PG.

Signode Corporation: *See—*
Kato, Kanami, 5,024,149, Cl. 100-32.000.
Sikand, Parminder S.; McAllister, Mary J.; Henel, John; Jackson, Allen L.; and Bell, Karen, to Harris Corporation. Computerized system for incoming calls. 5,025,468, Cl. 379-67.000.
Silva, Fernando G., to Eastman Kodak Company. Circuit for decoding binary information. 5,025,328, Cl. 360-46.000.
Simecek, Cyril; and Ryba, Jiri, to TESLA, koncernovy podnik. Apparatus for distribution evaluation of regional lung ventilation. 5,024,233, Cl. 128-659.000.
SIMES, Societa Italiana Medicinali e Sintetici S.p.A.: *See—*
Casagrande, Cesare; Montanari, Stefania; and Santangelo, Francesco, 5,025,011, Cl. 514-234.200.
Simon Container Machinery Limited: *See—*
Critchlow, Graham, 5,024,266, Cl. 165-89.000.
Simon, Robert H. M.: *See—*
Kavanagh, Dean L.; and Simon, Robert H. M., 5,024,895, Cl. 428-437.000.
Simonetto, Charles M., to Rene Tourolle et Fils (Societe A Responsabilite Limitee). Method of deforming two opposite edges of a single workpiece by machining, and apparatus for implementing the method. 5,024,075, Cl. 72-38.000.
Sindelar, Joseph L., Sr. Putting practice device. 5,024,442, Cl. 273-186.00C.
Singh, Guryinder P. Apparatus and method for expert analysis of metal failure with automated visual aids. 5,025,392, Cl. 364-513.000.
SinghDeo, Narendra N.; Mahulikar, Deepak; and Butt, Sheldon H., to Olin Corporation. Electronic packaging of components incorporating a ceramic-glass-metal composite. 5,024,883, Cl. 428-323.000.
Sipel Electronics S.A.: *See—*
Salvi, Jean-Francois, 5,023,997, Cl. 30-175.000.
Sircar, Ila: *See—*
Doherty, Annette M.; Hudspeth, James P.; Kaltenbronn, James S.; Repine, Joseph T.; Roark, William H.; Sircar, Ila; and Tinney, Francis J., 5,024,994, Cl. 514-18.000.
Sistare, James R.: *See—*
Looper, Timothy J.; and Sistare, James R., 5,023,999, Cl. 30-390.000.
Sitton, Gary L. Super setter plastic fishing hook. 5,024,020, Cl. 43-43.160.
Sitzmann, Michael E., to United States of America, Navy. Bis(2-fluoro-2,2-dinitroethyl)carbonate pentafluorosulfanylimine. 5,025,102, Cl. 558-6.000.
Sjostrom, Douglas D., to Smith & Nephew Dyonics Inc. Breakable needle and hinged needle guide. 5,024,659, Cl. 604-110.000.
SKI Accessories, Inc.: *See—*
Goode, David P., 5,024,866, Cl. 428-36.400.
Skolnik, Howard; and Gewirtz, Jonah, to Skolnik Industries Inc. Process and apparatus for koshering container lids. 5,024,597, Cl. 432-2.000.
Skolnik Industries Inc.: *See—*
Skolnik, Howard; and Gewirtz, Jonah, 5,024,597, Cl. 432-2.000.
Slautterback Corporation: *See—*
Faulkner, W. Harrison, III; and Colton, Douglas E., 5,024,709, Cl. 156-69.000.
Slezak, Raymond J., to RJS Corporation. Creel loading apparatus. 5,024,477, Cl. 294-81.200.
Slone, Michael D. Vehicle heating device. 5,025,130, Cl. 219-203.000.
Smallwood, David O.: *See—*
Gregory, Danny L.; Priddy, Tommy G.; Smallwood, David O.; and Woodall, Tommy D., 5,024,096, Cl. 73-663.800.
Smid, Johannes; Cabasso, Israel; Obligin, Alan; and Rawls, H. Ralph, to Research Foundation of State University of NY, The. Novel radiopaque heavy metal polymer complexes, compositions of matter and articles prepared therefrom. 5,024,232, Cl. 128-654.000.
Smital, Frantisek: *See—*
Fucik, Borivoj; Petranek, Milan; and Smital, Frantisek, 5,024,068, Cl. 66-53.000.
Smith, Alan B., to Digital Equipment Corporation. Electrical guide for tight tolerance machining. 5,023,991, Cl. 29-603.000.
Smith, Clement V., to Bird Machine Company. Bowl head assembly. 5,024,649, Cl. 494-85.000.
Smith, David E., to Victory Arms Co., Limited. Self-loading pistols. 5,024,016, Cl. 42-25.000.
Smith, Don: *See—*
Dalrymple, Monte J.; Verinsky, Phillip D.; and Smith, Don, 5,025,412, Cl. 364-900.000.
Smith, Donald L.: *See—*
Harp, Raymond S.; and Smith, Donald L., 5,024,799, Cl. 264-284.000.
Smith, George A., to Union Camp Corporation. Polymerized fatty acid polyamide resin dispersions and method for the manufacture thereof. 5,025,043, Cl. 523-326.000.
Smith, Kim R.; and Borland, James E., to Ethyl Corporation. Synergistic lime soap dispersing composition. 5,024,777, Cl. 252-117.000.
Smith, Lloyd A.: *See—*
Scott, Brian L.; Smith, Lloyd A.; Newell, J. Mark; Balentine, Bruce E.; and Lin, Lisan S., 5,025,471, Cl. 381-43.000.
Smith, Mark R. Multiflex exercise device. 5,024,434, Cl. 272-123.000.
Smith & Nephew Dyonics Inc.: *See—*
Sjostrom, Douglas D., 5,024,659, Cl. 604-110.000.
Smith, Robert W.: *See—*
Shekleton, Jack R.; and Smith, Robert W., 5,024,058, Cl. 60-752.000.
Smith, Tempel, Jr.; Miletic, Veselko; Bayer, George; Coutre, Christopher A.; Reichel, William L.; and Chronowski, Mirek J., to Tempel Steel Company. Flatness tester. 5,025,223, Cl. 324-662.000.
Smith, Thomas M. Infra-red equipment. 5,024,596, Cl. 431-328.000.
Smith, Todd S.; and Kelman, David C., to DePuy, Division of Boehringer Mannheim Corporation. Polymeric bearing component. 5,024,670, Cl. 623-18.000.
Smothers, William K.; Doraiswamy, Krishna C.; and Armstrong, Mark L., to Du Pont de Nemours, E. I., and Company. Dry film process for altering wavelength response of holograms. 5,024,909, Cl. 430-1.000.
Snake River Chemicals, Inc.: *See—*
Chollet, Charles C., 5,024,690, Cl. 71-77.000.
Snelgrove, R. Vernon: *See—*
McCullough, Francis P., Jr.; Snelgrove, R. Vernon; and Hall, David M., 5,024,877, Cl. 428-282.000.
Snow, Kevin M.: *See—*
Davis, Gary C.; McGrath, Barbara E.; and Snow, Kevin M., 5,025,074, Cl. 528-15.000.
Snowden, Gregory O.: *See—*
DeLuca, Michael J.; Snowden, Gregory O.; and Fennell, Robert D., 5,025,252, Cl. 340-825.440.
Snyder General Corporation: *See—*
Schumacher, David B.; and Bakowski, Steven J., 5,024,595, Cl. 431-18.000.
Snyder, Susan L. Comb for practicing selective hair coloring. 5,024,243, Cl. 132-116.000.
Snyder, Thomas S.; Jackovitz, John F.; and Ferrari, Harry M., to Westinghouse Electric Corp. System and method for continuous separation of isotopes. 5,024,749, Cl. 204-299.00R.
Societe Anonyme des Eaux Minerales d'Evian: *See—*
Dekerle, Benoit, 5,024,341, Cl. 215-11.100.
S.A. des Etablissements Staubli: *See—*
Truchet, Gaston, 5,024,467, Cl. 285-36.000.
Societe Anonyme dite: CEGELEC: *See—*
Heng, Jean-Paul; and Marmonier, Andre , 5,024,608, Cl. 439-578.000.
Societe Europeenne de Propulsion: *See—*
Robinbrosse, Christian; Naslain, Roger; Minet, Jacky; and Langlais, Francis, 5,024,878, Cl. 428-297.000.
Societe Industrielle de Plastiques en abrege "Sipla": *See—*
Serve, Philippe, 5,024,330, Cl. 206-486.000.
Societe Nationale Elf Aquitaine (Production): *See—*
Doussiet, Roger; and Labadie, Louis, 5,024,110, Cl. 73-864.620.
Societe Nationale Industrielle et Aerospatiale: *See—*
Maisonneuve, Jean-Michel; Domergue, Jean-Paul; Parize, Gabrielle; Palandjian, Philippe; and Isbert, Jacques, 5,024,502, Cl. 350-96.160.
Societe Nationale Industrielle et Aetospatiale: *See—*
Barquet, Henri; Negroni, Pierre-Paul; and Plissonneau, Bernard, 5,024,399, Cl. 244-119.000.
Societe Technique de Pulverisation—STEP: *See—*
Jouillat, Claude; and Brunet, Michel, 5,024,355, Cl. 222-162.000.
Soclof, Sidney I., to Rockwell International Corporation. PNP type lateral transistor with minimal substrate operation interference. 5,025,302, Cl. 357-55.000.
Soerens, Dave A., to Kimberly-Clark Corporation. Creping adhesive composition. 5,025,046, Cl. 524-72.000.
Sogo Security Services Co.: *See—*
Ichikawa, Hiroshi, 5,025,243, Cl. 338-18.000.
Sohner, Harold K.; Hoyloak, Joel N.; Girvin, Richard J.; and Kumar, Surinder, to Andrew Corporation. Full-duplex, sub-band spread spectrum communications system. 5,025,452, Cl. 375-1.000.
Soltech, Inc.: *See—*
Nelson, Thomas E., 5,024,210, Cl. 126-344.000.
Soma, Noriko: *See—*
Kiriseko, Tadashi; Tani, Hiromichi; Soma, Noriko; Shigemi, Nobuhisa; and Toyoda, Takayuki, 5,024,570, Cl. 414-222.000.
Soma, Shinobu: *See—*
Shoji, Hisashi; Tamura, Akihiko; Itaya, Masahiko; Fuma, Hiroshi; and Soma, Shinobu, 5,024,181, Cl. 118-658.000.
Soma, Toru: *See—*
Ishidoya, Masahiro; Soma, Toru; and Ogawa, Hisao, 5,025,061, Cl. 524-539.000.
Son, Wan-jae, to Samsung Electron Devices Co., Ltd. Dynamic focusing electron gun. 5,025,189, Cl. 313-414.000.
Sone, Toshiyuki; Matsumoto, Takehiko; Omotezako, Nobuya; and Kawasuji, Keiji, to Car Mate Mfg. Co., Ltd. Automatic disc carrying and playing device. 5,025,338, Cl. 360-99.060.
Sonin, Inc.: *See—*
Pape, Robert; Rose, William; Burgel, Frank; and Adams, Chip, 5,023,996, Cl. 30-144.000.
Sonoco Products Company: *See—*
Haenni, Edwin W.; and Bolz, Hans-Peter, 5,024,349, Cl. 221-46.000.
Sony Corporation: *See—*
Avis, Richard J. A., 5,025,495, Cl. 358-140.000.
Nishino, Yoichi, 5,025,419, Cl. 365-221.000.
Ozawa, Kazuo; and Sato, Masanori, 5,024,394, Cl. 242-198.000.
Watanabe, Nobuhisa, 5,025,368, Cl. 364-200.000.
Soprema S.A.: *See—*
Geisen, Pierre; and Reillaudoux, Jean-Claude, 5,024,886, Cl. 428-332.000.
Sotralentz S. A.: *See—*
Roser, Georges, 5,024,346, Cl. 220-401.000.
Soubrier, Pierre; and Denis, Xavier, to Baxter International Inc. Apparatus for positioning a port in an aperture in a web of film. 5,024,645, Cl. 493-380.000.

Southam, Barry J.: *See*—
Krigmont, Henry V.; Coe, Everett L., Jr.; and Southam, Barry J., 5,024,171, Cl. 110-345.000.

Southcott, Mark R.: *See*—
Dobinson, Bryan; and Southcott, Mark R., 5,025,084, Cl. 528-229.000.

Spamer, William S., to Mead Corporation, The. Composite organizer. 5,024,336, Cl. 211-59.200.

Spatafora, Mario; and Gamberini, Antonio, to G. D Societa per Azioni. Method and device for wrapping cylindrical products. 5,024,046, Cl. 53-466.000.

Spector, George: *See*—
Guzman, Julio; and Spector, George, 5,024,546, Cl. 401-16.000.
Ippolito, Guy F.; and Spector, George, 5,024,566, Cl. 408-197.000.
Tidalgo, Max B.; and Spector, George, 5,024,440, Cl. 273-145.00A.

Spence, Scott L.: *See*—
Van Fossen, Robert A.; Spence, Scott L.; and DeWitt, Donald E., 5,024,294, Cl. 184-108.000.

Spencer, Charles R.: *See*—
Oldham, James G.; Spencer, Charles R.; Begley, Carl L.; and Meyer, H. Robert, 5,025,150, Cl. 250-253.000.

Spencer, Dennis S., to Olemunda Pty. Ltd. Bandage applicator. 5,024,217, Cl. 128-82.000.

Speranza, George P.: *See*—
Lin, Jiang-Jen; and Speranza, George P., 5,025,100, Cl. 549-551.000.

Speronello, Barry K.; Byrne, John W.; and Chen, James M., to Engelhard Corporation. Staged metal-promoted zeolite catalysts and method for catalytic reduction of nitrogen oxides using the same. 5,024,981, Cl. 502-67.000.

Spinnler, Fritz: *See*—
Jetzer, Gregor; Kolb, Roland; and Spinnler, Fritz, 5,024,589, Cl. 418-55.300.

Square D Company: *See*—
Chapman, Donald L., 5,024,251, Cl. 138-92.000.

Srinivasan, Jagannathan S., to Westinghouse Electric Corp. Method for steam generator water level measurement. 5,024,802, Cl. 376-258.000.

Sta-Rite Industries, Inc.: *See*—
Kralovec, William M., 5,024,585, Cl. 417-360.000.

Stachler, Richard J. Non-smear erasable label kit. 5,024,332, Cl. 206-575.000.

Stachura, Leonard M.: *See*—
Logsdon, Peter B.; Stachura, Leonard M.; Swan, Ellen L.; and Basu, Bajat S., 5,024,781, Cl. 252-171.000.

Stackpool, Michael; and Riley, David, to Chloride Silent Power Limited. Apparatus for filling and sealing alkali metal electrode containers for alkali metal energy conversion devices and method of filling alkali metal electrode containers for alkali metal energy conversion devices. 5,024,675, Cl. 29-623.100.

Stafford, Gary P., to Marconi Company Limited, The. Circularly polarized antenna with resonant aperture in ground plane and probe feed. 5,025,264, Cl. 343-767.000.

Stafford Rail Products, Inc.: *See*—
Stafford, Richard J., III, 5,024,381, Cl. 238-367.000.

Stafford, Richard J., III, to Stafford Rail Products, Inc. Active railroad spike and tie plate interconnection therefor. 5,024,381, Cl. 238-367.000.

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Mathad, Gangadhara S.; Stanasolovich, David; and Via, Giorgio G., 5,024,896, Cl. 428-473.500.

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Goad, Conrad D.; and Taylor, Jeffrey L., 5,024,851, Cl. 427-2.000.

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Boyd, John A.; and Staples, George M., III, 5,024,770, Cl. 210-747.000.

Staubli International AG: *See*—
Daggett, Kenneth E., 5,025,390, Cl. 364-513.000.

STC PLC: *See*—
Gunn, Duncan A.; and McManus, Stephen J., 5,024,503, Cl. 350-96.200.

Steele, Lawrence C., to Eastman Kodak Company. Method and apparatus for improving a multi-color electrophotographic image using heat fusing. 5,025,292, Cl. 355-326.000.

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Prelini, Cesare; Trovati, Aldo; Gambini, Tiziana; and Stefanoli, Vittorio, 5,024,674, Cl. 8-554.000.

Stefansky, Frederick M., to Conner Peripherals, Inc. Architecture for 2½ inch diameter single disk drive. 5,025,335, Cl. 360-97.010.

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Matucha, Karl-Heinz; Steffens, Thomas; Baureis, Hans-Paul; Bickle, Wolfgang; and Braus, Jurgen, 5,024,881, Cl. 428-323.000.
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Steinberg, Joe: *See*—
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Steinmann, Alfred, to Ciba-Geigy Corporation. Organometal-containing polymers and use thereof in a photosensitive composition with photoacid generators. 5,024,916, Cl. 430-270.000.

Steljes, Robert C. Bedside commode station for invalid patients. 5,023,962, Cl. 4-480.000.

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Crater, Davis H.; Howells, Richard D.; Stern, Richard M.; and Temperante, John A., 5,025,052, Cl. 524-104.000.

Sternby, Jan P., to Gambro AB. Dialysis system and method therefor. 5,024,756, Cl. 210-93.000.

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Stevens, Thomas H.: *See*—
Germer, Warren R.; Coryea, Peter F.; Keturakis, Andrius A.; Masury, David H.; and Stevens, Thomas H., 5,025,206, Cl. 324-74.000.

Stewart, Peter J., to Seaford Nominees Pty. Ltd. Dewatering means. 5,024,005, Cl. 34-164.000.

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Gorun, Sergiu M.; and Stibrany, Robert T., 5,025,101, Cl. 556-50.000.

Stierman, Roger J.; and Lessard, Robert J., to Texas Instruments Incorporated. Fixture and a method for plating contact bumps for integrated circuits. 5,024,746, Cl. 204-297.00W.

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Tsuchiya, Paul F.; and Stine, Robert H., 5,025,491, Cl. 340-825.520.

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Dumenek, Vladimir A.; Stolyarenko, Georgy E.; and Kossovsky, Leopold V., 5,024,652, Cl. 604-22.000.

Stone, Mark L.: *See*—
Bobsein, Rex L.; Stone, Mark L.; and Geibel, Jon F., 5,024,876, Cl. 428-272.000.

Stoner, Eugene M.: *See*—
Knight, C. Reed, Jr.; and Stoner, Eugene M., 5,024,139, Cl. 89-154.000.

Storage Technology Corporation: *See*—
Nelson, Thomas C., 5,025,398, Cl. 364-519.000.

Stork, Johannes M. C.: *See*—
Harame, David L.; and Stork, Johannes M. C., 5,024,957, Cl. 437-31.000.

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Ganser, Hans G.; Schafer, Ralf; and Stormberg, Hans P., 5,025,197, Cl. 315-172.000.

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Engebretson, A. Maynard, 5,024,224, Cl. 128-420.600.

Straschil, Heinrich K.: *See*—
Abys, Joseph A.; and Straschil, Heinrich K., 5,024,733, Cl. 204-3.000.

Strathman, Michael D.: *See*—
Odom, Robert W.; and Strathman, Michael D., 5,025,144, Cl. 250-207.000.

Stravitz, David M. Carousel storage device with rotating objects on top thereof. 5,024,168, Cl. 108-94.000.

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Modena, Silvana; and Strepparola, Ezio, 5,025,105, Cl. 562-851.000.

Strickler, John R.: *See*—
Chiu, Kuen-Wai; Yu, Lin-Chen; and Strickler, John R., 5,025,096, Cl. 544-234.000.

Strippgen, Walter E.: *See*—
Asher, Marc A.; Strippgen, Walter E.; Heinig, Charles F.; and Carson, William, 5,024,213, Cl. 128-69.000.

Stripping Technologies Inc.: *See*—
Abbott, Kenneth E.; and Lyons, Patrick J., 5,024,029, Cl. 51-438.000.

Strobel, Donald H.: *See*—
Thornborough, Raymond J.; and Strobel, Donald H., 5,025,470, Cl. 379-107.000.

Strominger, Jack L.: *See*—
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Strub, Eric W.; and Strub, Kenneth M. Band guiding and forming assembly for banding apparatus. 5,024,049, Cl. 53-585.000.

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Strub, Eric W.; and Strub, Kenneth M., 5,024,049, Cl. 53-585.000.

Stufflebeam, John F.: *See*—
Warner, Steven D.; and Stufflebeam, John F., 5,024,279, Cl. 172-1.000.

Stypulkowski, Paul H.: *See*—
van den Honert, Christopher; and Stypulkowski, Paul H., 5,024,612, Cl. 604-36.000.

Su, David K., to Hewlett-Packard Company. Current mirror using resistor ratios in CMOS process. 5,025,204, Cl. 323-274.000.

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Gorler, Klaus; Krumbiegel, Gunter; Hanack, Michael; and Subramanian, Lakshmina R., 5,024,743, Cl. 204-157.690.

Suda, Hirohisa; Sasaki, Katsumi; and Osato, Yasukuni, to Fujikura Ltd. Method and apparatus for cutting an optical fiber. 5,024,363, Cl. 225-96.005.

Sudo, Shoichi; Sakai, Yoshihisa; Yasaka, Hiroshi; Ikegami, Tetsuhiko; Yoshikuni, Yuzo; Yokohama, Itaru; and Kubodera, Kenichi, to Nippon Telegraph & Telephone Corporation. Method and apparatus for stabilizing frequency of semiconductor laser. 5,025,448, Cl. 372-32.000.

Sugai, Toshiji: *See*—
Miura, Katsutoshi; Koyama, Hiroyasu; Sugai, Toshiji; Yamada, Hiroaki; and Sakurai, Einosuke, 5,025,012, Cl. 514-252.000.

Suganuma, Katsuaki; Fujii, Hiroyuki; Minakuchi, Hiroyoshi; Kada, Katsuhiko; Osafune, Haruo; and Kanamaru, Kuniaki, to Shimadzu Corporation. Fiber-reinforced metal. 5,024,902, Cl. 428-633.000.
Sugata, Hiroyuki: *See*—
Mihara, Chieko; Santoh, Tsuyoshi; and Sugata, Hiroyuki, 5,024,917, Cl. 430-271.000.
Sugawara, Kenzo: *See*—
Arai, Kei; Ohashi, Minoru; Utsugi, Yoshio; Oka, Osamu; Numazawa, Kenichi; Miwa, Kenji; and Sugawara, Kenzo, 5,024,816, Cl. 422-68.100.
Sugawara, Michitaka, to Kabushiki Kaisha Toshiba. Volume data transmission system. 5,025,375, Cl. 364-413.220.
Suggs, Steven M., to Pressure Services, Inc. Liveload assembly for rotary or reciprocating shaft packing. 5,024,453, Cl. 277-106.000.
Sughrue, Edward L., II; Tooley, Patricia A.; Bertus, Brent J.; and Grayson, Bille S., to Phillips Petroleum Company. Process for converting heavy hydrocarbon oil. 5,024,750, Cl. 208-57.000.
Sugimoto, Naoki: *See*—
Nakamura, Arao; Manabe, Tsuneo; Sugimoto, Naoki; and Usui, Hiroshi, 5,024,974, Cl. 501-57.000.
Sugiura, Shinji: *See*—
Yabuta, Motoshi; Nakao, Yasushi; Sugiura, Shinji; Fukuda, Mitsuhiro; and Miyamoto, Yuzo, 5,025,060, Cl. 524-533.000.
Sugiyama, Yoshihide: *See*—
Seki, Nobuyoshi; Morii, Nobuyuki; Sugiyama, Yoshihide; Komada, Takashi; Hosoi, Masatoshi; Hujiwara, Atuhisa; Ichinose, Tsutomu; Mori, Goro; Kikuchi, Toshiyuki; and Minato, Masahiro, 5,024,430, Cl. 270-53.000.
Sugiyasu Industries Co., Ltd.: *See*—
Kawada, Hiroyuki, 5,024,141, Cl. 91-171.000.
Sumitomo Rubber Industries, Ltd.: *See*—
Ochiai, Kiyoshi, 5,024,260, Cl. 152-209.00R.
Summers, Jack C., II: *See*—
Henk, Michael G.; and Summers, Jack C., II, 5,024,824, Cl. 423-213.500.
Summers, Russell E., Jr.: *See*—
Phebus, Dan E.; Schrader, William A.; and Summers, Russell E., Jr., 5,024,636, Cl. 475-141.000.
Sumpter, Chris A.: *See*—
Lewis, Larry N.; and Sumpter, Chris A., 5,025,073, Cl. 528-15.000.
Sun Chemical Corporation: *See*—
Schwartz, Russell J.; and Gregorio, Manuel Z., 5,024,698, Cl. 106-20.000.
Sunden, Gunnel E.: *See*—
Brandstrom, Arne E.; Lindberg, Fer L.; and Sunden, Gunnel E., 5,025,024, Cl. 514-338.000.
Sundstrand Corporation: *See*—
Cohen, Mordechai, 5,024,416, Cl. 251-78.000.
Latos, Thomas S., 5,025,360, Cl. 363-16.000.
Shekleton, Jack R.; and Smith, Robert W., 5,024,058, Cl. 60-752.000.
Sundstrand Data Control, Inc.: *See*—
Norling, Brian L., 5,024,089, Cl. 73-517.00B.
Sung, Chien-Min: *See*—
Chen, Sy-Hwa; and Sung, Chien-Min, 5,024,680, Cl. 51-295.000.
Sunou, Hiroki: *See*—
Kobayashi, Kazumitsu; and Sunou, Hiroki, 5,024,201, Cl. 123-531.000.
Sunshine, Abraham; Laska, Eugene M.; and Siegel, Carole E., to Analgesic Associates. Cough/cold mixtures comprising non-steroidal anti-inflammatory drugs. 5,025,019, Cl. 514-277.000.
Superba S.A.: *See*—
Enderlin, Robert, 5,024,390, Cl. 242-47.000.
Suppelsa, Anthony B.: *See*—
Altman, Leonard F.; Flaugher, Jill L.; Suppelsa, Anthony B.; and Mullen, William B., III, 5,024,372, Cl. 228-248.000.
Surgical Systems & Instruments, Inc.: *See*—
Shiber, Samuel, 5,024,651, Cl. 604-22.000.
Suter, Henry, to United States of America, Navy. Sonic detection and tracking system. 5,025,425, Cl. 367-96.000.
Suto, Hidemi: *See*—
Akasaki, Yutaka; Aonuma, Hidekazu; Nukada, Katsumi; Tokita, Akihiko; Suto, Hidemi; Sato, Katsuhiro; and Tanaka, Hiroyuki, 5,024,911, Cl. 430-58.000.
Sutor, Judith L.: *See*—
Fay, Gary V.; Robb, Stephen P.; Sutor, Judith L.; and Terry, Lewis E., 5,025,298, Cl. 357-41.000.
Sutton, Allen R.; and Balser, Richard L., to Freeport McMoRan Resource Partners. Nitrogen fertilizer. 5,024,689, Cl. 71-29.000.
Sutton, Owen W., to AT&T Bell Laboratories. Underwater magnetic switch for electrical cable transmitting A.C. electrical current. 5,025,170, Cl. 307-116.000.
Suwabe, Hiroyuki: *See*—
Kondo, Hitoshi; Suwabe, Hiroyuki; and Kojima, Aiki, 5,025,230, Cl. 331-116.0FE.
Suya, Hachiro: *See*—
Yoshida, Mamoru; Suya, Hachiro; Hayashi, Shoji; Koshiyama, Takao; Hashimoto, Satoshi; and Horita, Katsuhiro, 5,025,042, Cl. 523-216.000.
Suzuki, Eiichi: *See*—
Ubayama, Takashi; Suzuki, Eiichi; and Morishima, Morito, 5,025,173, Cl. 307-265.000.
Suzuki, Fumio: *See*—
Taya, Hiroyuki; Yoshinuma, Mikio; Yamada, Takeshi; Nishide, Kenji; Suzuki, Fumio; Fujimoto, Hirohisa; and Yamauchi, Ryozo, 5,024,501, Cl. 350-96.150.
Suzuki, George: *See*—
Yamada, Ichiji; Inuzuka, Yutaka; Murakami, Michiyuki; Suzuki, George; Tanahashi, Tyo; and Kondo, Takeshi, 5,024,117, Cl. 74-473.00P.
Suzuki, Goro: *See*—
Yamamoto, Yohzoh; Suzuki, Goro; Nakamura, Hideo; and Yasuda, Kiyomi, 5,025,067, Cl. 525-109.000.
Suzuki, Hajime, to Daicel Chemical Industries Co., Ltd. Copolymer polyamide resin from hydrogenated polyolefin condensate. 5,025,070, Cl. 525-184.000.
Suzuki, Hajime: *See*—
Kawabata, Susumu; Yoshida, Kazunori; Kisanuki, Yoshikatsu; Suzuki, Hajime; and Shiraki, Masao, 5,024,253, Cl. 139-99.000.
Suzuki, Hideo: *See*—
Oohashi, Keiji; Araki, Shinji; Suzuki, Hideo; and Shimomichi, Tsuyoshi, 5,024,688, Cl. 65-3.120.
Suzuki, Hidetoshi; Nomura, Ichiro; Majima, Toshiaki; and Yamamoto, Mitsuru, to Canon Kabushiki Kaisha. Image forming device with beam current control. 5,025,196, Cl. 315-168.000.
Suzuki Jidosha Kogyo Kabushiki Kaisha: *See*—
Murano, Katsuaki; Yamashita, Yoshinori; Hirano, Sadayuki; Tatsumi, Takumi; and Yamamoto, Hiroaki, 5,024,310, Cl. 192-0.076.
Suzuki, Koichi: *See*—
Etoh, Yoshiyuki; Inoue, Hiroshi; Mori, Kazuyuki; Suzuki, Koichi; Nakano, Kinichiro; Nomura, Hiroyuki; Yamamoto, Isao; and Yoshida, Kiyoshi, 5,025,379, Cl. 364-426.040.
Neishi, Toshie; Kikuchi, Toshihiro; Takiguchi, Takao; Suzuki, Koichi; and Matsumoto, Masakazu, 5,024,912, Cl. 430-59.000.
Suzuki, Masanori: *See*—
Tateishi, Kiyoshi; Sakata, Haruyasu; Tawaragi, Yuji; Suzuki, Masanori; and Ohie, Takayuki, 5,025,434, Cl. 369-44.360.
Suzuki, Michio, to Tokyo Electric Co., Ltd. Label printer. 5,025,397, Cl. 364-519.000.
Suzuki, Mikio: *See*—
Fujikawa, Yoshihiro; Suzuki, Mikio; Iwasaki, Hiroshi; Sakashita, Mitsuaki; and Kirahara, Masaki, 5,024,999, Cl. 514-63.000.
Suzuki, Satoshi; Kuwabara, Osamu; Muto, Jiro; and Shinozaki, Eiichi, to Casio Computer Co., Ltd. Bonding structure of an electronic device and a method for manufacturing the same. 5,025,348, Cl. 361-398.000.
Suzuki, Tatsuya: *See*—
Inoue, Takashi; Suzuki, Tatsuya; Kimura, Akiteru; Miyazaki, Hiroaki; and Katagiri, Moriya, 5,025,277, Cl. 354-173.100.
Suzuki, Yasuo: *See*—
Igarashi, Eiji; Imamiya, Susumu; and Suzuki, Yasuo, 5,024,261, Cl. 152-527.000.
Suzuki, Yoshiaki; and Hayashi, Gouichi, to Fuji Photo Film Co., Ltd. Infrared absorbent compositions. 5,024,923, Cl. 430-372.000.
Suzumura, Nobuyasu: *See*—
Kokubo, Kouichi; Hamada, Toshiaki; Tagawa, Shinichi; Suzumura, Nobuyasu; Buma, Shuuichi; Aburaya, Toshio; Onuma, Toshio; Sato, Kunihito; Yonekawa, Takashi; Kawanishi, Masaki; Ikemoto, Hiroyuki; and Ohashi, Kaoru, 5,024,459, Cl. 280-707.000.
Svetkoff, Donald J.; and Doss, Brian L., to Synthetic Vision Systems, Inc. Method and system for high-speed, high-resolution, 3-D imaging of an object at a vision station. 5,024,529, Cl. 356-376.000.
Svets- & Maskinprodukter i Lidkoping AB: *See*—
Hulden, Fritiof, 5,024,010, Cl. 37-118.00R.
Swan, Ellen L.: *See*—
Logsdon, Peter B.; Stachura, Leonard M.; Swan, Ellen L.; and Basu, Bajat S., 5,024,781, Cl. 252-171.000.
Swann, George H. Quick-change head for precision machine vise. 5,024,427, Cl. 269-136.000.
Swanson, Jerald L.: *See*—
Wuepper, Karl J.; Swanson, Jerald L.; and Hartz, Dale E., 5,023,987, Cl. 29-402.110.
Swanson, Roger W., to Hewlett-Packard Company. Method of interpolating pixel values. 5,025,405, Cl. 364-723.000.
Swapceinski, John P.: *See*—
Guslits, Vladimir S.; and Swapceinski, John P., 5,025,289, Cl. 355-253.000.
Swartz, Robert G.: *See*—
Ota, Yusuke; and Swartz, Robert G., 5,025,456, Cl. 375-76.000.
Swatling, Donald K.: *See*—
Finn, Leslie E.; Swatling, Donald K.; and Mankin, Erle D., 5,024,782, Cl. 252-174.130.
Swedo, Raymond J.: *See*—
Zupancic, Joseph J.; Swedo, Raymond J.; Jamieson, Donald R.; Schumacher, Elaine F.; and Buehler, Allyson J., 5,025,079, Cl. 528-170.000.
Swei, Gwo S.: *See*—
Arthur, David J.; and Swei, Gwo S., 5,024,871, Cl. 428-209.000.
Swersky, Robert S. Wind baffle adjustable for different car widths. 5,024,481, Cl. 296-180.100.
Swetlin, Brian J.: *See*—
Gawin, Irena; and Swetlin, Brian J., 5,025,045, Cl. 523-440.000.
SWF-Auto-Electric GmbH: *See*—
Bauer, Kurt; and Schmid, Eckhardt, 5,023,972, Cl. 15-250.420.
Swierczek, Remi D. Integral label and coaster. 5,024,014, Cl. 40-310.000.
Swift Instruments, Inc.: *See*—
Hayashi, George, 5,024,513, Cl. 350-518.000.
Synthes U.S.A.: *See*—
Tepic, Slobodan, 5,024,618, Cl. 606-53.000.

Synthetic Vision Systems, Inc.: *See*—
Svetkoff, Donald J.; and Doss, Brian L., 5,024,529, Cl. 356-376.000.
Szczesny, David S.: *See*—
Bennett, Glenn E.; Lucius, John E.; Polk, Roger N.; Rider, Frederick H.; and Szczesny, David S., 5,024,627, Cl. 439-631.000.
Szeleny, Istvan: *See*—
Ahrens, Kurt H.; Schickaneder, Helmut; Engler, Heidrun; and Szeleny, Istvan, 5,025,016, Cl. 514-274.000.
Szweda, Andrew: *See*—
Millard, Michael L.; Harrison, Michael G.; and Szweda, Andrew, 5,024,859, Cl. 427-226.000.
T Cell Sciences, Inc.: *See*—
Brenner, Michael B.; Strominger, Jack L.; Seidman, Jonathan; Ip, Stephen H.; and Krangel, Micahel S., 5,024,940, Cl. 435-69.100.
Tachikawa, Toru: *See*—
Kasatani, Yasushi; and Tachikawa, Toru, 5,024,605, Cl. 439-500.000.
Ueda, Tetsuya; Tachikawa, Toru; and Takehara, Masataka, 5,025,307, Cl. 357-80.000.
Tacke, Peter; Grigo, Ulrich; Nouvertne, Werner; Freitag, Dieter; Idel, Karsten-Josef; and Westeppe, Uwe, to Bayer Aktiengesellschaft. Fire-retardant polycarbonates and polyesters. 5,025,065, Cl. 524-611.000.
Tagawa, Shinichi: *See*—
Kokubo, Kouichi; Hamada, Toshiaki; Tagawa, Shinichi; Suzumura, Nobuyasu; Buma, Shuuichi; Aburaya, Toshio; Onuma, Toshio; Sato, Kunihito; Yonekawa, Takashi; Kawanishi, Masaki; Ikemoto, Hiroyuki; and Ohashi, Kaoru, 5,024,459, Cl. 280-707.000.
Tago, Yoshiaki: *See*—
Yamashita, Hiroshi; Tago, Yoshiaki; and Yoshimaru, Tomohisa, 5,025,437, Cl. 369-79.000.
Taguchi, Hideo: *See*—
Shindo, Masamichi; Sakurai, Toshiharu; Taguchi, Hideo; and Izawa, Nobu, 5,025,347, Cl. 361-386.000.
Taguchi, Ryusuke: *See*—
Nagato, Shoin; Taguchi, Ryusuke; Hirai, Kenji; Hirose, Hiroaki; and Yokota, Masahiro, 5,024,692, Cl. 71-86.000.
Tai, Hiromichi: *See*—
Takanashi, Itsuo; Nakagaki, Shintaro; Shinonaga, Hirohiko; Asakura, Tsutou; Furuya, Masato; and Tai, Hiromichi, 5,025,209, Cl. 324-96.000.
Taira, Susumu: *See*—
Nagasaki, Wataru; Endo, Takuro; Taira, Susumu; and Muramatsu, Hajime, 5,024,087, Cl. 73-516.00R.
Tajima, Yusuke; and Gels, Robert G., to Raytheon Company. Amplifier having substantially constant D.C. to r.f. conversion efficiency. 5,025,225, Cl. 330-124.00D.
Takagi, Atsushi: *See*—
Nakamura, Hiroaki; and Takagi, Atsushi, 5,025,282, Cl. 355-38.000.
Takahashi, Kazuaki: *See*—
Hasegawa, Makoto; Takahashi, Kazuaki; Makimoto, Mitsuo; Takahashi, Masao; and Shimazu, Takayuki, 5,025,229, Cl. 331-107.00A.
Takahashi, Masao: *See*—
Hasegawa, Makoto; Takahashi, Kazuaki; Makimoto, Mitsuo; Takahashi, Masao; and Shimazu, Takayuki, 5,025,229, Cl. 331-107.00A.
Takahashi, Osamu: *See*—
Naruse, Hideaki; Takahashi, Osamu; Ohki, Nobutaka; and Ono, Michio, 5,024,924, Cl. 430-376.000.
Takahashi, Tatsunori: *See*—
Miura, Masao; Uchida, Naoshi; Takahashi, Tatsunori; Asakawa, Kouji; and Nozawa, Eiji, 5,025,236, Cl. 335-46.000.
Takahashi, Tsutomu: *See*—
Kurihara, Kazumasa; and Takahashi, Tsutomu, 5,024,305, Cl. 192-0.055.
Takahashi, Yoshinobu: *See*—
Tanaka, Masaki; Ohashi, Hiroshi; and Takahashi, Yoshinobu, 5,025,076, Cl. 528-33.000.
Takahiro, Syuji: *See*—
Funato, Ryo; Takahiro, Syuji; Yoshida, Keiji; Kubo, Shinji; and Inagaki, Motoshi, 5,024,914, Cl. 430-109.000.
Takanashi, Itsuo; Nakagaki, Shintaro; Shinonaga, Hirohiko; Asakura, Tsutou; Furuya, Masato; and Tai, Hiromichi, to Victor Company of Japan, Ltd. Apparatus for detecting surface potential distribution. 5,025,209, Cl. 324-96.000.
Takarada, Mitsuhiro; and Sato, Kazuharu, to Shin-Etsu Chemical Co., Ltd. Alkoxysilylated acrylic or vinylic resin containing primer compositions. 5,025,049, Cl. 524-91.000.
Takayama, Satoshi: *See*—
Tanaka, Tsuneo; Sato, Kazue; Takewa, Hiroyuki; Kurozuka, Akira; Tamura, Tadashi; Hattori, Katsuji; Takayama, Satoshi; Murata, Kosaku; Satoh, Katsuaki; Serikawa, Mituhiko; Kimura, Youichi; and Obata, Shuichi, 5,025,474, Cl. 381-90.000.
Takeda Chemical Industries, Ltd.: *See*—
Goto, Giichi; and Nagaoka, Akinobu, 5,025,033, Cl. 514-417.000.
Nomura, Hiroaki; Nishikawa, Kohei; Tsushima, Susumu; and Kozai, Yoshio, 5,025,005, Cl. 514-183.000.
Takegahara, Takashi: *See*—
Seki, Masaki; Takegahara, Takashi; and Nakajima, Masatoshi, 5,025,363, Cl. 364-191.000.
Takehara, Masataka: *See*—
Ueda, Tetsuya; Tachikawa, Toru; and Takehara, Masataka, 5,025,307, Cl. 357-80.000.
Takemae, Yoshihiro: *See*—
Masuyama, Masaru; Takemae, Yoshihiro; Endoh, Tetsuhiko; Komyoji, Hirosuke; Tanaka, Ryuji; and Itakura, Katsuhiko, 5,025,415, Cl. 365-52.000.
Takemura, Toji; and Okubo, Takashi, to Nissan Motor Co., Ltd. Rotational speed differential responsive type control coupling. 5,024,309, Cl. 192-60.000.
Takemura, Toshihiko: *See*—
Fukui, Tetsu; Yoshii, Takashi; Takemura, Toshihiko; and Hattori, Akio, 5,024,306, Cl. 192-3.570.
Takeno, Minoru, to Fujitsu Limited. Peak level detection circuit. 5,025,176, Cl. 307-351.000.
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Takeuchi, Akira: *See*—
Teranishi, Mitsuji; Watanabe, Yasuo; and Takeuchi, Akira, 5,025,384, Cl. 364-468.000.
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Mitsuishi, Akio; Takeuchi, Takashi; and Koshiishi, Osamu, 5,024,543, Cl. 400-124.000.
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Iida, Shinzi; Takeya, Fuminori; and Aoki, Shinya, 5,025,343, Cl. 360-127.000.
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Ohashi, Yasusuke; Fujino, Toshihiro; Taki, Yasuhito; and Nishijima, Tamotsu, 5,024,815, Cl. 420-487.000.
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Neishi, Toshie; Kikuchi, Toshihiro; Takiguchi, Takao; Suzuki, Koichi; and Matsumoto, Masakazu, 5,024,912, Cl. 430-59.000.
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Tallman, James L.; and Sherbeck, Terry G., to Tektronix, Inc. Method which provides debounced inputs from a touch screen panel by waiting until each x and y coordinates stop altering. 5,025,411, Cl. 364-900.000.
Tamura, Akihiko: *See*—
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Tamura, Fumiaki: *See*—
Junji; and Tamura, Fumiaki, 5,024,505, Cl. 350-96.220.
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Tan, Josef N. S., to Critikon, Inc. Epidural oxygen sensor. 5,024,226, Cl. 128-633.000.
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Toriyama, Daigoro, 5,024,478, Cl. 294-88.000.
Tanahashi, Tyo: *See*—
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Tanaka, Fumiki: *See*—
Inoue, Haruki; Funabashi, Motohisa; Yahiro, Masakazu; and Tanaka, Fumiki, 5,025,499, Cl. 364-165.000.
Tanaka, Hiroaki; Enya, Takeshi; and Nakamura, Katsumi, to Nippondenso Co., Ltd.; and Nippon Soken, Inc. Power source circuit and bridge type measuring device with output compensating circuit utilizing the same. 5,024,101, Cl. 73-766.000.
Tanaka, Hiroshi: *See*—
Tsutahara, Kouichirou; and Tanaka, Hiroshi, 5,025,133, Cl. 219-462.000.
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Tanaka, Minoru, to Seiko Epson Corporation. Magnetic actuator. 5,024,542, Cl. 400-124.000.
Tanaka, Nariaki: *See*—
Yoshida, Takeshi; Nakatani, Kaname; Fukami, Toshiyuki; and Tanaka, Nariaki, 5,024,913, Cl. 430-67.000.
Tanaka, Nobuhiro; Hirata, Eiji; Moriguchi, Hideyuki; Azekura, Ko; Tsubone, Akira; and Ryu, Yasunori, to Kao Corporation; and Seibu Electric & Machinery Co., Ltd. Goods handling method and apparatus thereof. 5,024,572, Cl. 414-276.000.

Tanaka, Ryuji: *See*—
Masuyama, Masaru; Takemae, Yoshihiro; Endoh, Tetsuhiko; Komyoji, Hirosuke; Tanaka, Ryuji; and Itakura, Katsuhiko, 5,025,415, Cl. 365-52.000.
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Omata, Tetsuo; Senda, Shuji; Tanaka, Tamaki; Kumagai, Eriko; Kajimoto, Chikara; and Nakazono, Yutaka, 5,024,832, Cl. 424-84.000.
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Tancrell, Roger H.: *See*—
Wilson, David T.; and Tancrell, Roger H., 5,024,872, Cl. 428-212.000.
Tang, John C.; and Minneman, Scott L., to Xerox Corporation. Apparatus allowing remote interactive use of a plurality of writing surfaces. 5,025,314, Cl. 358-93.000.
Tang, William C.; and Howe, Roger T., to University of California, Regents of the. Laterally driven resonant microstructures. 5,025,346, Cl. 361-283.000.
Tangradi, Leroy J.: *See*—
Csongor, Rezso J.; and Tangradi, Leroy J., 5,025,485, Cl. 455-12.000.
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Kiriseko, Tadashi; Tani, Hiromichi; Soma, Noriko; Shigemi, Nobuhisa; and Toyoda, Takayuki, 5,024,570, Cl. 414-222.000.
Taniguchi, Hiroshi; Kubo, Kanji; and Nakase, Hiromi, to Matsushita Electric Industrial Co., Ltd. Electronically controlled magnetic tape editing device. 5,025,329, Cl. 360-77.160.
Taniguchi, Nobuyuki; Hata, Yoshiaki; Kudo, Yoshinobu; Inoue, Manabu; Hoda, Takeo; and Ueda, Hiroshi, to Minolta Camera Kabushiki Kaisha. Photographic camera. 5,025,275, Cl. 354-106.000.
Tanihara, Isaji: *See*—
Matuo, Ken-iti; Nakata, Muneo; Hori, Mitukazu; and Tanihara, Isaji, 5,025,238, Cl. 335-128.000.
Tanii, Junichi: *See*—
Ishimura, Toshihiko; Okuno, Akira; Tanii, Junichi; and Seki, Reiji, 5,025,239, Cl. 335-265.000.
Tanji, Masaki; and Nishijima, Toyoki, to Konica Corporation. Light-sensitive silver halide photographic material. 5,024,932, Cl. 430-567.000.
Tank, John T., to Pyropower Corporation. Multi-stage vortex reactor. 5,024,684, Cl. 55-92.000.
Tardio, Don: *See*—
Bensoussan, David; and Tardio, Don, 5,025,134, Cl. 219-494.000.
Tatch, Michael D.: *See*—
Miller, Phillip E.; Katz, Leonoard R.; Nath, Raymond J.; Blaushild, Ronald M.; Tatch, Michael D.; Kordalski, Frank J.; Wykstra, Donald T.; and Kavalkovich, William M., 5,025,129, Cl. 219-201.000.
Tateishi, Kiyoshi; Sakata, Haruyasu; Tawaragi, Yuji; Suzuki, Masanori; and Ohie, Takayuki, to Pioneer Electronic Corporation. Tracking servo apparatus of disk player. 5,025,434, Cl. 369-44.360.
Tatsumi, Takumi: *See*—
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TAURUS Gumiipari Vallalat: *See*—
Fejerdy, Istvan; Farkas, Otto ; and Havasi, Gabor, 5,024,424, Cl. 267-64.270.
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Murakami, Satoru; Yamaguchi, Minori; Hayashi, Akimine; Kondo, Masataka; and Tawada, Yoshihisa, 5,025,297, Cl. 357-30.000.
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Tawaragi, Yuji: *See*—
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Taya, Hiroyuki; Yoshinuma, Mikio; Yamada, Takeshi; Nishide, Kenji; Suzuki, Fumio; Fujimoto, Hirohisa; and Yamauchi, Ryozo, to Fujikura Ltd. Manufacturing method for polarization maintaining optical fiber couplers. 5,024,501, Cl. 350-96.150.
Taylor, Dale F., to General Electric Company. Corrosion resistant composite claddings for nuclear fuel rods. 5,024,809, Cl. 376-417.000.
Taylor, Jeffrey L.: *See*—
Goad, Conrad D.; and Taylor, Jeffrey L., 5,024,851, Cl. 427-2.000.
Taylor, Stewart S., to TriQuint Semiconductor, Inc. High-gain low-noise amplifier. 5,025,226, Cl. 330-277.000.
Tazi, Mohammed: *See*—
Helioff, Michael W.; Tazi, Mohammed; Kwak, Yoon T.; and Login, Robert B., 5,024,779, Cl. 252-162.000.
Tchatalian, Bruno: *See*—
Renaudin, Robert; and Tchatalian, Bruno, 5,024,803, Cl. 376-270.000.
Technical Products Co., Ltd.: *See*—
Saitoh, Takashi, 5,024,640, Cl. 493-127.000.
Teijin Seiki Company Limited: *See*—
Ako, Hidenobu, 5,025,199, Cl. 318-561.000.
Tektronix, Inc.: *See*—
Tallman, James L.; and Sherbeck, Terry G., 5,025,411, Cl. 364-900.000.
Teledyne Industries, Inc.: *See*—
Murray, Roger W.; and Godhwani, Nevand, 5,024,962, Cl. 437-40.000.
Telefunken electronic GmbH: *See*—
Colquhoun, Alexander; and Berchtold, Klaus, 5,025,260, Cl. 342-127.000.
Telemecanique: *See*—
Arnould, Jacques, 5,025,299, Cl. 357-45.000.
Telettra-Telefonia Elettronica e Radio S.p.A.: *See*—
Cucchi, Silvio; and Carbone, Stefano, 5,025,460, Cl. 375-118.000.
Tempel Steel Company: *See*—
Smith, Tempel, Jr.; Miletic, Veselko; Bayer, George; Coutre, Christopher A.; Reichel, William L.; and Chronowski, Mirek J., 5,025,223, Cl. 324-662.000.
Temperante, John A.: *See*—
Crater, Davis H.; Howells, Richard D.; Stern, Richard M.; and Temperante, John A., 5,025,052, Cl. 524-104.000.
Tenryu Marusawa Kabushiki Kaisha: *See*—
Osawa, Masanori, 5,024,311, Cl. 192-84.00T.
Tentler, Michael L.; and Wheeler, Gerald L. Viscosity-insensitive variable-area flowmeter. 5,024,105, Cl. 73-861.580.
Tepic, Slobodan, to Synthes U.S.A. External fixation device. 5,024,618, Cl. 606-53.000.
Terada, Masayuki; Saito, Shinji; and Miura, Asahiko, to Shin-Kobe Electric Machinery Co., Ltd. Lead storage battery. 5,024,908, Cl. 429-245.000.
Terakado, Yoshimitsu; and Yamazaki, Nobuto, to Kabushiki Kaisha Shinkawa. Wire bonding method. 5,024,367, Cl. 228-111.000.
Teranishi, Mitsuji; Watanabe, Yasuo; and Takeuchi, Akira, to Asics Corporation. Production process control system. 5,025,384, Cl. 364-468.000.
Terasawa, Tomizo: *See*—
Arakawa, Masao; Terasawa, Tomizo; Ogawa, Masanobu; and Kami, Hironori, 5,025,169, Cl. 250-574.000.
Terrestrial Engineering Corporation: *See*—
Pfeil, Richard A., Jr.; and Pirrera, Charles M., 5,024,061, Cl. 62-77.000.
Terry, Claude E.: *See*—
Blakely, Lawrence W.; Howe, Michael A.; Pinholster, Daniel F., Jr.; Terry, Claude E.; and McIntosh, Robert H., Sr., 5,024,840, Cl. 424-404.000.
Terry, Lewis E.: *See*—
Fay, Gary V.; Robb, Stephen P.; Sutor, Judith L.; and Terry, Lewis E., 5,025,298, Cl. 357-41.000.
Terumo Kabushiki Kaisha: *See*—
Ide, Tetsuya, 5,024,622, Cl. 439-829.000.
Tesch, Gunter. Bed cover. 5,023,970, Cl. 5-502.000.
TESLA, koncernovy podnik: *See*—
Simecek, Cyril; and Ryba, Jiri, 5,024,233, Cl. 128-659.000.
Testa-Laboratorium A/S: *See*—
Kohnke, Ole B., 5,024,653, Cl. 604-35.000.
Tetart, Serge; and Lericque, Bernard, to Isover Saint-Gobain. Composition for gluing discontinuous mineral fibers in order to obtain insulation products. 5,025,077, Cl. 528-86.000.
Tetlow, Peter E.: *See*—
Greenshields, James N.; and Tetlow, Peter E., 5,024,821, Cl. 423-23.000.
Tetra Dev-Co: *See*—
Bordini, Giorgio; and Vincenzi, Maurizio, 5,024,584, Cl. 417-342.000.
Texaco Chemical Company: *See*—
Lin, Jiang-Jen; and Speranza, George P., 5,025,100, Cl. 549-551.000.
Sanderson, John R.; Marquis, Edward T.; and Knifton, John F., 5,025,112, Cl. 585-852.000.
Sanderson, John R.; and Knifton, John F., 5,025,113, Cl. 568-909.800.
Texaco Inc.: *See*—
Colvert, James H., 5,024,730, Cl. 196-132.000.
Texas Instruments Deutschland GmbH: *See*—
Viereck, Bruno, 5,025,492, Cl. 342-144.000.
Texas Instruments Incorporated: *See*—
Brighton, Jeffrey E., 5,025,303, Cl. 357-68.000.
Gill, Manzur; and McElroy, David J., 5,025,494, Cl. 357-23.500.
Gulley, David W.; and Van Aken, Jerry R., 5,025,407, Cl. 364-754.000.
Haken, Roger A., 5,024,960, Cl. 437-34.000.
Johnson, Randall E.; and Drumm, James M., 5,025,306, Cl. 357-75.000.
Lamb, William E.; Kowaleski, Jerome L.; Haikl, Vojtech; Bittancourt, Alan R.; and Daugherty, Harvey S., 5,025,280, Cl. 354-299.000.
Mydill, Marc R.; Pile, Sam R.; O'Keefe, Sheila; Okerblom, Neal F.; and Keenan, W. Russ, 5,025,205, Cl. 324-73.100.
Pavio, Anthony M., 5,025,232, Cl. 333-26.000.
Porter, Vernon R.; and Penn, Thomas C., 5,024,918, Cl. 430-269.000.
Stierman, Roger J.; and Lessard, Robert J., 5,024,746, Cl. 204-297.00W.
Williams, Rodney D.; and Garcia, Felix, 5,024,494, Cl. 350-3.600.
Thacker, James R., to Siemens-Pacesetter, Inc. Hemodynamically rate responsive pacemaker and method of automatically adjusting the escape and A-V intervals. 5,024,222, Cl. 128-419.0PG.
Thangavelu, Kandasamy, to Otis Elevator Company. Relative system response elevator dispatcher system using artificial intelligence to vary bonuses and penalties. 5,024,295, Cl. 187-125.000.
Theeuwes, Felix: *See*—
Edgren, David E.; and Theeuwes, Felix, 5,024,842, Cl. 424-473.000.

Thera: *See—*
Gasser, Oswald; Guggenberger, Rainer; and Burger, Bernd, 5,024,711, Cl. 156-153.000.
Thessin, Tyler R.: *See—*
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Thetford Corporation: *See—*
Mercer, Albert E., 5,023,959, Cl. 4-321.000.
Thibault, Paul A.: *See—*
Bouchard, Andre C.; Thibault, Paul A.; Lagushenko Radomir; Maya, Jakob; and Maya, Jakob, 5,025,190, Cl. 313-619.000.
Thierry, Alan A.: *See—*
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Thiokol Corporation: *See—*
Canterberry, J. B.; and Flanigan, David A., 5,024,160, Cl. 102-323.000.
Thomas Industries, Inc.: *See—*
Toledo, George F., 5,024,070, Cl. 70-370.000.
Thomas, Jan B. Bicycle cooler. 5,024,359, Cl. 224-36.000.
Thomas, Rudy V., to Allied-Signal Inc. Free running cinching latch plate. 5,023,980, Cl. 24-196.000.
Thomas, William H.: *See—*
Santanam, Chandran B.; Thomas, William H.; and DeJulio, Emil R., 5,024,170, Cl. 110-264.000.
Thompson, Bobbie J.; and Thompson, Tamela T., to Thompson, Tamela T. Scarf clip adapter for brooch or earring. 5,023,978, Cl. 24-3.00L.
Thompson, Tamela T.: *See—*
Thompson, Bobbie J.; and Thompson, Tamela T., 5,023,978, Cl. 24-3.00L.
Thomson-Csf: *See—*
Bousquet, Philippe; and Lehureau, Jean-Claude, 5,025,341, Cl. 360-120.000.
Thomson Hybrides et Microondes: *See—*
Gloanec, Maurice; Jarry, Jacques; and Lailler, Jean L., 5,025,212, Cl. 324-158.00R.
Thomson-LGT Laboratoire General des Telecommunications: *See—*
Gauthier, Dominique, 5,025,207, Cl. 324-77.00A.
Thornborough, Raymond J.; and Strobel, Donald H., to Badger Meter, Inc. Automatic meter reading system with malfunction protection. 5,025,470, Cl. 379-107.000.
Thornton, Roy J.; and Rodriguez, Susan B., to Massey University. Method of reducing L-malic acid in juice medium. 5,024,845, Cl. 426-15.000.
Thunker, Norbert; Pollich, Gerhard; and Luxem, Heiner, to Heidelberger Druckmaschinen AG. Sheet transfer device for a printing machine. 5,024,432, Cl. 271-268.000.
Thurman, Laurance R.; Dowd, Joseph P.; and Fischer, Kathy J., to BASF Corporation. Method of producing HPN and mixtures thereof. 5,024,772, Cl. 252-1.000.
Tibbetts, Gary G.; Gorkiewicz, Daniel W.; and Hammond, Dean C., Jr., to General Motors Corporation. Apparatus for forming carbon fibers. 5,024,818, Cl. 422-158.000.
Tichenor, Clyde I.: *See—*
Zuchowski, Larry; Tichenor, Clyde I.; and Ginsburgh, Irwin, 5,024,521, Cl. 352-86.000.
Tidalgo, Max B.; and Spector, George. Dice a word. 5,024,440, Cl. 273-145.00A.
Tienken, Alfred G., to Federal-Mogul Corporation. Vehicle clearance lamp assembly. 5,025,350, Cl. 362-61.000.
Tilles, Arno W.: *See—*
McGrath, Thomas M.; and Tilles, Arno W., 5,024,759, Cl. 210-222.000.
Tillmann, Heinz: *See—*
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Tilman, Paul A., to Zip-Pak Incorporated. Tape carried pre-cut zipper. 5,024,537, Cl. 383-63.000.
Timken Company, The: *See—*
Otto, Dennis L., 5,024,449, Cl. 277-37.000.
Timmerman, Craig L., to Battelle Memorial Institute. System for enhanced destruction of hazardous wastes by in situ vitrification of soil. 5,024,556, Cl. 405-128.000.
Timmington, David A., to Griffin-Woodhouse Limited. End fittings for wire rope. 5,024,548, Cl. 403-78.000.
Tinney, Francis J.: *See—*
Doherty, Annette M.; Hudspeth, James P.; Kaltenbronn, James S.; Repine, Joseph T.; Roark, William H.; Sircar, Ila; and Tinney, Francis J., 5,024,994, Cl. 514-18.000.
Tioxide Group, PLC: *See—*
Jones, William J.; and Appleyard, Ian P., 5,024,827, Cl. 423-610.000.
Tisne-Versailles, Jacky: *See—*
Patoiseau, Jean F.; Autin, Jean-Marie; Cousse, Henri; Sales, Veronique; Tisne-Versailles, Jacky; and Bali, Jean-Pierre, 5,025,015, Cl. 514-274.000.
Todd, John: *See—*
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Tohyama, Syunroku: *See—*
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Tokai Rubber Industries, Ltd.: *See—*
Miyakawa, Shinji; and Ito, Michio, 5,024,461, Cl. 280-710.000.
Tokin Corporation: *See—*
Kaneko, Katsuhiko; and Nishida, Minoru, 5,024,388, Cl. 241-301.000.
Tokita, Akihiko: *See—*
Akasaki, Yutaka; Aonuma, Hidekazu; Nukada, Katsumi; Tokita, Akihiko; Suto, Hidemi; Sato, Katsuhiro; and Tanaka, Hiroyuki, 5,024,911, Cl. 430-58.000.
Toko, Inc.: *See—*
Kasahara, Takeshi, 5,024,955, Cl. 437-27.000.
Tokyo Eizai Laboratory Co., Ltd.: *See—*
Shiono, Katuaki, 5,024,216, Cl. 128-80.00C.
Tokyo Electric Co., The: *See—*
Ohshima, Masaaki; Kobayashi, Akira; Atsumi, Senji; and Shimada, Hiromi, 5,024,907, Cl. 429-191.000.
Tokyo Electric Co., Ltd.: *See—*
Suzuki, Michio, 5,025,397, Cl. 364-519.000.
Toledo, George F., to Thomas Industries, Inc. Lock mounting pad. 5,024,070, Cl. 70-370.000.
Tomeraasen, Paul L.: *See—*
Miller, Steven D.; McDonald, Joseph C.; Eichner, Fred N.; and Tomeraasen, Paul L., 5,025,159, Cl. 250-337.000.
Tomisawa, Yutaka; Fukuda, Toshikazu; and Inoue, Kazuhiko, to Kabushiki Kaisha Toshiba. Semiconductor device for detecting or emitting a magnetic line of force or light. 5,025,305, Cl. 357-72.000.
Tomita, Katsuhiko: *See—*
Kotani, Haruo; and Tomita, Katsuhiko, 5,024,951, Cl. 436-8.000.
Tomita, Koji: *See—*
Konishi, Masataka; Tomita, Koji; Oka, Masahisa; and Numata, Ken-ichi, 5,025,023, Cl. 514-183.000.
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Tool, Cornelis J. J.: *See—*
Cordfunke, Erik H. P.; and Tool, Cornelis J. J., 5,025,152, Cl. 250-281.000.
Tooley, Patricia A.; Cheung, Tin-Tack P.; Cymbaluk, Ted H.; Nowack, Gerhard P.; and Johnson, Marvin M., to Phillips Petroleum Company. Sorption of trialkyl arsines. 5,024,683, Cl. 55-74.000.
Tooley, Patricia A.: *See—*
Sughrue, Edward L., II; Tooley, Patricia A.; Bertus, Brent J.; and Grayson, Bille S., 5,024,750, Cl. 208-57.000.
Toray Industries, Inc.: *See—*
Kubo, Nami; Yoshioka, Toshio; Saito, Kouichi; and Tohyama, Syunroku, 5,024,767, Cl. 210-682.000.
Toray Silicone Company, Limited: *See—*
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Toriyama, Daigoro, to Tanabe Machinery Co., Ltd. Box blank holding device in a box-making machine. 5,024,478, Cl. 294-88.000.
Torok, Gabor P.: *See—*
Craft, Adam B.; and Torok, Gabor P., 5,025,211, Cl. 324-158.00R.
Torok, Vilmos; and Loreth, Andrzej, to Astra-Vent AB. Electrostatic air treatment and movement system. 5,024,685, Cl. 55-117.000.
Torremans, Joseph L. G.: *See—*
Janssens, Frans E.; Torremans, Joseph L. G.; and Hens, Jozef F., 5,025,014, Cl. 514-258.000.
Torres, James E., to Ethyl Corporation. Ultraviolet-radiation stabilizer and flame retardant systems. 5,025,050, Cl. 524-91.000.
Torrington Company, The: *See—*
La Croix, Mark E., 5,025,240, Cl. 335-284.000.
Tosaka, Masaki: *See—*
Deguchi, Katsuhiko; Saito, Kozo; Saijo, Hiroyuki; and Tosaka, Masaki, 5,025,069, Cl. 252-174.170.
Toshita, Mitsuhiro: *See—*
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Touyer, Gaetan: *See—*
Demoute, Jean-Pierre; Touyer, Gaetan; and Mouren, Michel, 5,024,828, Cl. 424-1.100.
Townsend Engineering Company: *See—*
Dubois, Gerald N., III, 5,025,175, Cl. 307-326.000.
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Burack, John J.; LeGrange, Jane D.; and Townsend, Wesley P., 5,024,873, Cl. 428-220.000.
Toyoda, Takayuki: *See—*
Kiriseko, Tadashi; Tani, Hiromichi; Soma, Noriko; Shigemi, Nobuhisa; and Toyoda, Takayuki, 5,024,570, Cl. 414-222.000.
Toyota Jidosha Kabushiki Kaisha: *See—*
Kokubo, Kouichi; Hamada, Toshiaki; Tagawa, Shinichi; Suzumura, Nobuyasu; Buma, Shuuichi; Aburaya, Toshio; Onuma, Toshio; Sato, Kunihito; Yonekawa, Takashi; Kawanishi, Masaki; Ikemoto, Hiroyuki; and Ohashi, Kaoru, 5,024,459, Cl. 280-707.000.
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Harp, Raymond S.; and Smith, Donald L., 5,024,799, Cl. 264-284.000.

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Hill, Berlie R.; Watson, Thomas F., Sr.; and Triplett, Benny L., 5,024,875, Cl. 428-267.000.
TriQuint Semiconductor, Inc.: *See*—
Taylor, Stewart S., 5,025,226, Cl. 330-277.000.
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Poisel, Hans; and Trommer, Gert, 5,025,148, Cl. 250-227.120.
Trouet, Andre: *See*—
Rao, KSP Siva Bhushana; Dejonghe, Jean-Paul; Collard, Marie-Paule; and Trouet, Andre, 5,024,835, Cl. 424-85.910.
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Jansen, Michael; Sergant, Moshe; Ou, Szutsun S.; Wilcox, Jaroslava Z.; Yang, Jane J.; and Eaton, Larry R., 5,025,451, Cl. 372-50.000.
Trybulski, Eugene J.; and Brabander, Herbert J., to American Cyanamid Company. (3-amino-1-propynyl)methylthiothiophene derivatives. 5,025,099, Cl. 548-527.000.
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Kahl, W. Henry; Price, David E.; and Tsao, Nai-Cheng, 5,024,471, Cl. 292-97.000.
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Mui, Paul Y. H.; and Tso, Rosa Y. M., 5,024,547, Cl. 401-195.000.
Tsubone, Akira: *See*—
Tanaka, Nobuhiro; Hirata, Eiji; Moriguchi, Hideyuki; Azekura, Ko; Tsubone, Akira; and Ryu, Yasunori, 5,024,572, Cl. 414-276.000.
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Tsuchida, Yasuyuki; and Nakanishi, Yuki, to Sanyo Electric Co., Ltd. Vacuum cleaner. 5,023,973, Cl. 15-319.000.
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Tsunoda, Yoshito: *See*—
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Hulsman, Severien; and Salemink, Johannes H. A. G., 5,024,241, Cl. 131-84.200.
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Tyler, Hugh J., to Alcon Surgical, Inc. Insulated infusion and aspiration probe. 5,024,654, Cl. 604-43.000.
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Ashdown, Charles P.; Bewley, James G.; and Kenney, George B., 5,024,695, Cl. 75-338.000.
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Unde, Madhav A. Welding process. 5,024,371, Cl. 228-216.000.
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Smith, George A., 5,025,043, Cl. 523-326.000.
Union Carbide Chemicals and Plastics Technology Corporation: *See*—
Alsop, George M., 5,024,952, Cl. 436-177.000.
King, Stephen W., 5,025,094, Cl. 568-623.000.
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Unisys Corporation: *See*—
Mathur, Sanjay S.; and Fernando, John S., 5,025,365, Cl. 364-200.000.
Stamness, Jesse I.; Morrow, Raymond W.; and Asato, Edward E., 5,025,327, Cl. 360-45.000.
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Administer, National Aeronautics and Space Administration: *See*—
Nguyen, Tien M., 5,025,455, Cl. 375-53.000.
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Froes, Francis H.; and Eylon, Daniel, 5,024,369, Cl. 228-157.000.
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Rhodes, Melvin H., 5,025,224, Cl. 328-127.000.
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Filby, Evan E.; and Rankin, Richard A., 5,025,391, Cl. 364-513.000.
Gregory, Danny L.; Priddy, Tommy G.; Smallwood, David O.; and Woodall, Tommy D., 5,024,096, Cl. 73-663.000.
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Miller, Phillip E.; Katz, Leonoard R.; Nath, Raymond J.; Blaushild, Ronald M.; Tatch, Michael D.; Kordalski, Frank J.; Wykstra, Donald T.; and Kavalkovich, William M., 5,025,129, Cl. 219-201.000.
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Prinz, Gary A., 5,025,416, Cl. 365-170.000.
Ramstedt, Clarence F., 5,025,218, Cl. 324-334.000.
Sitzmann, Michael E., 5,025,102, Cl. 558-6.000.
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Bethe, Klaus W. B., 5,024,107, Cl. 73-862.650.
Broer, Dirk J.; and Van Der Veen, Jan, 5,024,850, Cl. 428-1.000.
Ganser, Hans G.; Schafer, Ralf; and Stormberg, Hans P., 5,025,197, Cl. 315-172.000.
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Hains, Ralph N., 5,025,250, Cl. 340-811.000.
Heinrich, Norbert, 5,025,371, Cl. 369-219.000.
Janssen, Augustus J. E. M.; Veldhuis, Raymond N. J.; Prins, Hendrik J.; and Vries, Lodewijk B., 5,025,404, Cl. 364-723.000.
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Van Vaals, Johannes J., 5,025,217, Cl. 324-322.000.
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United States Surgical Corporation: *See*—
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United Technologies Corporation: *See*—
Otfinoski, William F., 5,024,884, Cl. 428-328.000.
Trusch, Raymond B., 5,024,060, Cl. 62-51.200.
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Bodor, Nicholas S., 5,024,998, Cl. 514-58.000.
Bova, Frank J.; Fitzgerald, Lawrence T.; and Mauderli, Walter, 5,025,376, Cl. 364-413.260.

University of Kentucky Research Foundation: *See*—
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Collins, Glenn B.; Hildebrand, David F.; Lazzeri, Paul A.; Adams, Thomas R.; Parrott, Wayne A.; and Hartweck, Lynn M., 5,024,944, Cl. 435-172.300.

University of Liverpool, The: *See*—
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Unsworth, John. Shower curtain retainer. 5,023,964, Cl. 4-558.000.

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USX Corporation: *See*—
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Kuhasalo, Antti; Viitanen, Olavi; and Ilvespaa, Heikki, 5,024,729, Cl. 162-372.000.
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Sayegh, Emile G.; Vana, James G., Jr.; and Willey, Wendall D., 5,025,115, Cl. 174-117.00F.

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Gulley, David W.; and Van Aken, Jerry R., 5,025,407, Cl. 364-754.000.

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James, Bertram G., 5,025,193, Cl. 315-5.380.
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Hank Dietrich; and Gottlebe, Jurgen, 5,024,156, Cl. 101-216.000.

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Berger, Alexander, 5,025,201, Cl. 318-605.000.

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Vesuvius Crucible Company: *See—*
Fishler, Mark K.; Koten, Jean-Marie; and Dubois, Pascal, 5,024,422, Cl. 266-272.000.

Veuhoff, Freidrich-Wilh: *See—*
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Victor Company of Japan, Ltd.: *See—*
Hirayama, Hiromichi; Hara, Mitsuhiko; Mihara, Masato; and Harumatsu, Mitsuo, 5,025,331, Cl. 360-85.000.
Koguchi, Tatsushi; Ito, Shigehiro; Ebihara, Kazyuki; and Nishi, Yuji, 5,025,317, Cl. 358-167.000.
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Takanashi, Itsuo; Nakagaki, Shintaro; Shinonaga, Hirohiko; Asakura, Tsutou; Furuya, Masato; and Tai, Hiromichi, 5,025,209, Cl. 324-96.000.

Victoria University of Manchester: *See—*
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Viereck, Bruno, to Texas Instruments Deutschland GmbH. Damping circuit for the antenna resonance circuit of a radio transmitter-receiver. 5,025,492, Cl. 342-144.000.

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Kuhasalo, Antti; Viitanen, Olavi; and Ilvespaa, Heikki, 5,024,729, Cl. 162-372.000.

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Vincenzi, Maurizio: *See—*
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Vinden, Peter; Burton, Russell J.; and Vaioleti, Timote M., to Her Majesty the Queen In Right of New Zealand Acting by and Through the Minister of Forestry for New Zealand. Gaseous or vapor phase treatment of wood with boron preservatives. 5,024,861, Cl. 427-254.000.

Vinke, Johannes: *See—*
Ley, Gregor; Schultze, Wolfgang; Vinke, Johannes; and Wistuba, Eckehardt, 5,025,062, Cl. 524-556.000.

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Virginia Polytechnic Institute and State University: *See—*
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Vogel, Naomi R. Self adjusting and self securing shampoo tray. 5,023,963, Cl. 4-521.000.

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Von Duprin, Inc.: *See—*
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von Redwitz, Heribert, to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V. Measuring instrument for determining the scattering and absorption coefficient of the atmosphere. 5,024,526, Cl. 356-73.000.

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Vora, Rohitkumar H.; and Chen, Paul N., Sr., to Hoechst Celanese Corp. Copolyimides derived from 2,2-bis (amino phenyl) hexafluoropropane. 5,025,089, Cl. 528-353.000.

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Vrhel, Thomas, Jr.: *See—*
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Vrhel, Thomas, Sr.; and Vrhel, Thomas, Jr. Cyclically operating fluid drive motor with magnetically controlled diaphragm valves. 5,024,142, Cl. 91-271.000.

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W. L. Gore & Associates, Inc.: *See—*
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W. R. Grace & Co.-Conn.: *See—*
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Havens, Marvin R., 5,024,792, Cl. 264-22.000.
Jaeger, Hugh D., 5,024,004, Cl. 34-1.000.

W. Schlafhorst & Co.: *See—*
Grecksch, Hans; and Engelhardt, Dietmar, 5,024,389, Cl. 242-35.50A.

Wada, Hajime: *See—*
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Waggitt, Kevin P.: *See—*
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Waggon Union GmbH: *See—*
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Wagner, Klaus P.: *See—*
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Wagner, Wayne M.: *See—*
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Wahlquist, Randall W.: *See—*
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Wakabayashi, Hideaki, to Aisin Seiki Kabushiki Kaisha. Free wheel hub system. 5,024,307, Cl. 192-40.000.

Wallace, Jan D., to Warner-Lambert Company. Method of treating depression. 5,025,035, Cl. 514-530.000.

Waller, Roger A., to Chrysler Corporation. Dry air purge system for vapor canister. 5,024,687, Cl. 55-316.000.

Walley, David H. Plane-wave forming sheet explosive. 5,024,159, Cl. 102-289.000.

Walsh, David A.: *See—*
Lo, Young S.; Walsh, David A.; and Uwaydah, Ibrahim M., 5,025,031, Cl. 514-399.000.

Walsh, Dennis E.: *See—*
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Walter, John: *See—*
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Wang, Chin-Teh. Lampshade-shaped animal trap. 5,024,021, Cl. 43-62.000.

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Derudder, James L.; and Wang, I-Chung W., 5,025,066, Cl. 525-66.000.

Wang, Jason. Back rack for alleviating musculo-skeletal tension. 5,024,215, Cl. 128-75.000.

Wang, Sophia L.; Meyer, George R.; and Brinkman, Kerry C., to Nalco Chemical Company. Corrosion inhibitor for alcohol and gasohol fuels. 5,024,677, Cl. 44-335.000.

Wang, Tingyi, to Beiling Stone Group Co. Emergency compressed-air brake for automobiles. 5,024,490, Cl. 303-9.000.

Ward Machinery Company, The: *See—*
Razauskas, Anthony F.; and Duncan, Marlie A., 5,024,081, Cl. 73-104.000.

Ward, William R., to O-I Neg TV Products, Inc. Method of distributing workpieces between a conveyor and workstations. 5,024,315, Cl. 198-341.000.

Warner, Brian. Diagnostic locator for mechanically malfunctioning electronic circuitry. 5,024,095, Cl. 73-661.000.

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Doherty, Annette M.; Hudspeth, James P.; Kaltenbronn, James S.; Repine, Joseph T.; Roark, William H.; Sircar, Ila; and Tinney, Francis J., 5,024,994, Cl. 514-18.000.
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Warner, Richard L. Tool for forming sheet metal. 5,024,076, Cl. 72-211.000.
Warner, Steven D.; and Stufflebeam, John F., to JI. Case Corporation. Foldable implement carrier. 5,024,279, Cl. 172-1.000.
Warner & Swasey Company, The: *See*—
Ross, Jeffrey A., 5,025,214, Cl. 324-207.190.
Warren, Richard: *See*—
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Washecheck, Don M.: *See*—
Kaminsky, Mark P.; Kleefisch, Mark S.; Huff, George A.; Washecheck, Don M.; Alvarado-Swaisgood, Aileen E.; and Barr, Mark K., 5,024,984, Cl. 502-303.000.
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Washino, Shoichi: *See*—
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Wataya, Seiji; and Washino, Shoichi, 5,025,380, Cl. 364-431.050.
Wassenberg, Willy: *See*—
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Watanabe, Hideomi; and Okita, Tsutomu, to Fuji Photo Film Co., Ltd. Magnetic recording medium having a binder comprising a copolymer which includes a vinyl compound having a dialkylaminoalkyl group. 5,024,892, Cl. 428-423.100.
Watanabe, Isao: *See*—
Natori, Katsuhide; Watanabe, Isao; Katsuyama, Koji; Kawamura, Isao; Yamamoto, Karuhiko; and Nagai, Takeshi, 5,024,264, Cl. 165-1.000.
Watanabe, Isato, to Seikosha Co., Ltd. Electric power supply device for hand with load. 5,025,429, Cl. 368-238.000.
Watanabe, Masaki, to Olympus Optical Company Limited. Grinding and finishing apparatus and method. 5,024,024, Cl. 51-124.00L.
Watanabe, Nobuhisa, to Sony Corporation. Microprocessor with option area adjacent CPU core facilitating interfacing with peripheral devices. 5,025,368, Cl. 364-200.000.
Watanabe, Toshio; Sato, Masahiko; Osabe, Akio; Sakayori, Hiroyuki; and Mase, Akira, to Semiconductor Energy Laboratory Co., Ltd. Method of filling a liquid crystal device with ferroelectric liquid crystal material. 5,024,255, Cl. 141-11.000.
Watanabe, Yasuo: *See*—
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Wataya, Seiji; and Washino, Shoichi, to Mitsubishi Denki Kabushiki Kaisha. Method and device for controlling the operation of an engine for a vehicle. 5,025,380, Cl. 364-431.050.
Watson, Thomas F., Sr.: *See*—
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Watt, John S., to Commonwealth Scientific and Industrial Research Organisation. Measurement of flow velocity and mass flowrate. 5,025,160, Cl. 250-356.100.
Watts, Leonard A.; and Espinosa, Medardo, to EDS Technologies, Inc. Stacking method and apparatus. 5,024,569, Cl. 414-790.300.
Waukesha Specialties & Fabricators: *See*—
Bartley, John E., 5,024,407, Cl. 248-164.000.
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Bellows, James C.; and Koubek, Rudolph, III, 5,024,582, Cl. 416-213.00R.
Beuchel, Peter H., 5,024,559, Cl. 425-406.000.
Bice, Charles D., 5,024,452, Cl. 277-81.00R.
Bitton, Max D.; and Wahlquist, Randall W., 5,023,984, Cl. 29-81.050.
Blaushild, Ronald M., 5,024,804, Cl. 376-285.000.
Cioffi, Joseph V.; and Kerrey, John S., 5,024,806, Cl. 376-352.000.
Downs, Walter M.; and Ankrom, Michael J., 5,024,734, Cl. 204-15.000.
Groenendaal, John C., Jr.; and Rudy, Randy T., 5,024,579, Cl. 415-108.000.
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Impink, Albert J., Jr.; Grobmyer, Louis R.; Sariscak, Robert E.; Morita, Toshio; and Duryea, John L., 5,024,801, Cl. 376-217.000.
Land, John T.; and Hopkins, Ronald J., 5,024,808, Cl. 376-353.000.
Leksell, David; Kun, Zoltan K.; and Asars, Juris A., 5,025,321, Cl. 358-296.000.
Murray, Alexander P., 5,024,805, Cl. 376-305.000.
Piri, William E., 5,025,215, Cl. 324-220.000.
Snyder, Thomas S.; Jackovitz, John F.; and Ferrari, Harry M., 5,024,749, Cl. 204-299.00R.
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Whittaker, Dale Single use dental floss spindle and method. 5,024,324, Cl. 206-63.500.
Widlund, Leif U. R. Disposable diaper. 5,024,672, Cl. 604-390.000.
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Wilkening, Siegfried, to Vereinigte Aluminum-Werke Aktiengesellschaft. Method for manufacturing refractory oxide-carbon bricks. 5,024,793, Cl. 264-29.700.
Will, Manfred O., to KWM-Kunststoffmaschinen GmbH. Device for continuous degassing of mixes. 5,024,531, Cl. 366-75.000.
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Williams, Gary L.: *See*—
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Williams, Rodney D.; and Garcia, Felix, to Texas Instruments Incorporated. Focussed light source pointer for three dimensional display. 5,024,494, Cl. 350-3.600.
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Wilson, John F.; Rosal, Enrique R.; and Bucher, George D., to Westinghouse Electric Corp. Random fuel pellet vacuum transfer apparatus. 5,024,574, Cl. 414-416.000.
Wilson, Norman H.: *See*—
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Wingen, Rainer; Guenther, Dieter; and Lingnau, Juergen, to Hoechst Aktiengesellschaft. 4-chlorooxazole derivatives and processes for their preparation and use. 5,025,097, Cl. 548-235.000.
Winkelstein, Dan, to Northern Telecom Limited. Method of transient simulation of transmission line networks using a circuit simulator. 5,025,402, Cl. 364-578.000.
Winkler, Hans-Henning; and Rutschle, Eugen, to Chiron-Werke GmbH & Co. KG. Device for producing mounting bores or valve bores in a wheel disk. 5,023,983, Cl. 29-27.00R.
Winston, Charles R., Jr., to United Technologies Corporation. Semiconductor light source temperature measurement. 5,024,535, Cl. 374-178.000.
Winter, Horst, to Krones AG Hermann Kronseder Maschinenfabrik. Labelling apparatus. 5,024,717, Cl. 156-354.000.
Winter, Steven D.; Botich, Michael J.; and Adickes, Eric. Wind sailing surf vessel with dual planar surfaces. 5,024,177, Cl. 114-61.000.
Winzen, Wilfried, to Witzenmann GmbH Metallschlauch-Fabrik Pforzheim. Heat exchange medium connector for movable solar heaters. 5,024,211, Cl. 126-424.000.
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Wu, Stephen H. W.; Greene, Carol J.; and Sharma, Mahendra K., to Eastman Kodak Company. Water-dispersible polymeric compositions. 5,025,004, Cl. 514-165.000.
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Yabuta, Motoshi; Nakao, Yasushi; Sugiura, Shinji; Fukuda, Mitsuhiro; and Miyamoto, Yuzo, to Kansai Paint Co., Ltd. Dispersion of fine particles of a polymer. 5,025,060, Cl. 524-533.000.
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Yaguchi, Toshiyuki, to Kabushiki Kaisha Toshiba. Evaluation facilitating circuit device. 5,025,210, Cl. 324-158.00R.
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Saito, Yasuo; Yahata, Mitsuru; Honjo, Kouji; and Matsubayashi, Takayuki, 5,025,463, Cl. 378-19.000.
Yahiro, Masakazu: *See—*
Inoue, Haruki; Funabashi, Motohisa; Yahiro, Masakazu; and Tanaka, Fumiki, 5,025,499, Cl. 364-165.000.
Yamada, Hiroaki: *See—*
Miura, Katsutoshi; Koyama, Hiroyasu; Sugai, Toshiji; Yamada, Hiroaki; and Sakurai, Einosuke, 5,025,012, Cl. 514-252.000.
Yamada, Ichiji; Inuzuka, Yutaka; Murakami, Michiyuki; Suzuki, George; Tanahashi, Tyo; and Kondo, Takeshi, to Toyota Jidosha Kabushiki Kaisha; and Tsuda Industries Company, Ltd. Apparatus for supporting shift lever for transmission. 5,024,117, Cl. 74-473.00P.
Yamada, Katsuyuki; Ide, Yukio; Harigaya, Makoto; and Iwasaki, Hiroko, to Ricoh Company, Ltd. Information recording medium. 5,024,927, Cl. 430-495.000.
Yamada, Masato: *See—*
Egawa, Shunji; and Yamada, Masato, 5,024,533, Cl. 374-126.000.
Yamada, Osamu: *See—*
Matsumoto, Fukuji; Tawara, Yoshio; Hayashi, Michio; and Yamada, Osamu, 5,024,423, Cl. 266-283.000.
Yamada, Taiki: *See—*
Nakamura, Kyuzo; Ota, Yoshifumi; and Yamada, Taiki, 5,024,854, Cl. 427-38.000.
Yamada, Takeshi: *See—*
Taya, Hiroyuki; Yoshinuma, Mikio; Yamada, Takeshi; Nishide, Kenji; Suzuki, Fumio; Fujimoto, Hirohisa; and Yamauchi, Ryozo, 5,024,501, Cl. 350-96.150.
Yamada, Yukio: *See—*
Hasegawa, Hirofumi; Ohmori, Naoto; Yamada, Yukio; and Yoshida, Narutaka, 5,025,286, Cl. 355-244.000.
Yamagata, Hiroshi, to Yoshida Kogyo K.K. Method of forming metal surface thin film having high corrosion resistance and high adhesion. 5,024,721, Cl. 156-643.000.
Yamagishi, Hisashi; Kakiuchi, Shinichi; and Tomita, Seisuke, to Bridgestone Corporation. Golf ball. 5,024,444, Cl. 273-232.000.
Yamagiwa, Tamio, to Hi-Sonic Co., Ltd. Liquid shut-off valve. 5,024,254, Cl. 137-219.000.
Yamaguchi, Katsumasa: *See—*
Aoki, Shinichiro; Sato, Takeo; Yamaguchi, Katsumasa; and Yamamoto, Masaki, 5,025,168, Cl. 250-548.000.
Yamaguchi, Kimiaki, to Matsushita Electric Industrial Co., Ltd. Transformer having shielding wall for driving a magnetron. 5,025,489, Cl. 219-10.55B.
Yamaguchi, Minori: *See—*
Murakami, Satoru; Yamaguchi, Minori; Hayashi, Akimine; Kondo, Masataka; and Tawada, Yoshihisa, 5,025,297, Cl. 357-30.000.
Yamaguchi, Shigeru; and Mizutani, Ken-ichiro, to Aisin Kako Kabushiki Kaisha; and Aisin Seiki Kabushiki Kaisha. Cooling apparatus for heat exchanger. 5,024,267, Cl. 165-122.000.
Yamaha Corporation: *See—*
Shimizu, Yasushi; and Kawakami, Fukushi, 5,025,472, Cl. 381-63.000.
Ubayama, Takashi; Suzuki, Eiichi; and Morishima, Morito, 5,025,173, Cl. 307-265.000.
Yamaha Hatsudiki Kabushiki Kaisha: *See—*
Okui, Kaoru; and Kobayashi, Manabu, 5,024,287, Cl. 180-297.000.
Yamamoto Chemicals, Incorporated: *See—*
Itoh, Hisato; Enomoto, Katashi; Oguchi, Takahisa; and Nishizawa, Tsutomu, 5,024,926, Cl. 430-495.000.
Yamamoto, Hiroaki: *See—*
Murano, Katsuaki; Yamashita, Yoshinori; Hirano, Sadayuki; Tatsumi, Takumi; and Yamamoto, Hiroaki, 5,024,310, Cl. 192-0.076.
Yamamoto, Isao: *See—*
Etoh, Yoshiyuki; Inoue, Hiroshi; Mori, Kazuyuki; Suzuki, Koichi; Nakano, Kinichiro; Nomura, Hiroyuki; Yamamoto, Isao; and Yoshida, Kiyoshi, 5,025,379, Cl. 364-426.040.
Yamamoto, Karuhiko: *See—*
Natori, Katsuhide; Watanabe, Isao; Katsuyama, Koji; Kawamura, Isao; Yamamoto, Karuhiko; and Nagai, Takeshi, 5,024,264, Cl. 165-1.000.
Yamamoto, Masaki: *See—*
Aoki, Shinichiro; Sato, Takeo; Yamaguchi, Katsumasa; and Yamamoto, Masaki, 5,025,168, Cl. 250-548.000.
Yamamoto, Mitsuru: *See—*
Suzuki, Hidetoshi; Nomura, Ichiro; Majima, Toshiaki; and Yamamoto, Mitsuru, 5,025,196, Cl. 315-168.000.
Yamamoto, Osamu; and Yoshida, Toshihiko, to Sharp Kabushiki Kaisha. Optical pumping-type solid-state laser apparatus with a semiconductor laser device. 5,025,449, Cl. 372-32.000.
Yamamoto, Yohzoh; Suzuki, Goro; Nakamura, Hideo; and Yasuda, Kiyomi, to Mitsui Petrochemical Industries, Ltd. Partially cured epoxy resins and electrostatographic toner containing the same as binder. 5,025,067, Cl. 525-109.000.
Yamanari, Masaya; and Ikeda, Masami, to Kabushiki Kaisha Toshiba. Character reader device. 5,025,484, Cl. 382-61.000.
Yamane, Mitsuo, to Brother Kogyo Kabushiki Kaisha. Thermo-sensitive transfer ink ribbon to be used for producing dry type transfer material. 5,024,887, Cl. 428-335.000.
Yamane, Tsuneo: *See—*
Shimizu, Shoichi; and Yamane, Tsuneo, 5,024,942, Cl. 435-134.000.
Yamashita, Hiroshi; Tago, Yoshiaki; and Yoshimaru, Tomohisa, to Kabushiki Kaisha Toshiba. Interlocking braking and lock mechanisms for scanning apparatus of an information processing system. 5,025,437, Cl. 369-79.000.
Yamashita, Shoji: *See—*
Ito, Toshifumi; Ohta, Atsuo; and Yamashita, Shoji, 5,024,113, Cl. 74-6.000.

Yamashita, Yoshinori: *See*—
Murano, Katsuaki; Yamashita, Yoshinori; Hirano, Sadayuki; Tatsumi, Takumi; and Yamamoto, Hiroaki, 5,024,310, Cl. 192-0.076.
Yamauchi, Ryozo: *See*—
Taya, Hiroyuki; Yoshinuma, Mikio; Yamada, Takeshi; Nishide, Kenji; Suzuki, Fumio; Fujimoto, Hirohisa; and Yamauchi, Ryozo, 5,024,501, Cl. 350-96.150.
Yamauchi, Takahiro, to Oki Electric Industry Co., Ltd. Process for forming fine pattern in semiconductor device. 5,024,919, Cl. 430-312.000.
Yamazaki, Masahiko: *See*—
Saito, Yasuo; Fujimoto, Seiji; Nobuta, Yasuo; and Yamazaki, Masahiko, 5,025,462, Cl. 378-19.000.
Yamazaki, Nobuto: *See*—
Terakado, Yoshimitsu; and Yamazaki, Nobuto, 5,024,367, Cl. 228-111.000.
Yamazaki, Syoji; Oda, Toshikazu; Iwanaga, Kenji; and Gono, Yoshitaka, to Anritsu Corporation. Relay device for switching radio frequency signal. 5,025,237, Cl. 335-83.000.
Yan, Tsoung Y., to Mobil Oil Corporation. Upgrading of resids by liquid phase mild coking. 5,024,752, Cl. 208-131.000.
Yang, Anthony; and Yang, Victor. Emergency ladder equipment. 5,024,293, Cl. 182-93.000.
Yang, Huey-Lang; Todd, John; and Jou, Huey-Ling L., to Enzo Biochem, Inc. Method and kit for sample adherence to test substrate. 5,024,933, Cl. 435-6.000.
Yang, Jane J.: *See*—
Jansen, Michael; Sergant, Moshe; Ou, Szutsun S.; Wilcox, Jaroslava Z.; Yang, Jane J.; and Eaton, Larry R., 5,025,451, Cl. 372-50.000.
Yang, Victor: *See*—
Yang, Anthony; and Yang, Victor, 5,024,293, Cl. 182-93.000.
Yasaka, Hiroshi: *See*—
Sudo, Shoichi; Sakai, Yoshihisa; Yasaka, Hiroshi; Ikegami, Tetsuhiko; Yoshikuni, Yuzo; Yokohama, Itaru; and Kubodera, Kenichi, 5,025,448, Cl. 372-32.000.
Yassa, Fathy F.: *See*—
Hartley, Richard I.; Corbett, Peter F.; Yassa, Fathy F.; and Noujaim, Sharbel E., 5,025,257, Cl. 341-101.000.
Yasuda, Kiyomi: *See*—
Yamamoto, Yohzoh; Suzuki, Goro; Nakamura, Hideo; and Yasuda, Kiyomi, 5,025,067, Cl. 525-109.000.
Yasui, Yoshiharu; Anahara, Meiji; Asahi, Goro; and Miyake, Shiro, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho; and Japan Defense Agency. Three dimensional fabric with a linkage structure. 5,024,874, Cl. 428-257.000.
Yazaki Corporation: *See*—
Ohashi, Yasusuke; Fujino, Toshihiro; Taki, Yasuhito; and Nishijima, Tamotsu, 5,024,815, Cl. 420-487.000.
Yeager, Gary W.: *See*—
Cusano, Dominic A.; and Yeager, Gary W., 5,024,791, Cl. 264-21.000.
Yeh, An-Gong, to Du Pont de Nemours, E. I., and Company. On line control method to determine media fluidization in a media mill. 5,024,387, Cl. 241-21.000.
Yeh, Ling; and Harrelson, Hugh G., Jr., to BASF Corporation. Flame retardant fibers for textile use. 5,024,869, Cl. 428-97.000.
Yeh, Pochi A.; and Hong, John H., to Rockwell International Corporation. Optical heterodyne detector. 5,025,488, Cl. 455-619.000.
Yocum, Robert R.: *See*—
Maine, Gregory T.; Daves, Robert S.; and Yocum, Robert R., 5,024,941, Cl. 435-69.900.
Yokohama, Itaru: *See*—
Sudo, Shoichi; Sakai, Yoshihisa; Yasaka, Hiroshi; Ikegami, Tetsuhiko; Yoshikuni, Yuzo; Yokohama, Itaru; and Kubodera, Kenichi, 5,025,448, Cl. 372-32.000.
Yokohama Rubber Co., Ltd., The: *See*—
Igarashi, Eiji; Imamiya, Susumu; and Suzuki, Yasuo, 5,024,261, Cl. 152-527.000.
Yokota Machinery Co., Ltd.: *See*—
Yokota, Senichi, 5,024,370, Cl. 228-180.100.
Yokota, Masahiro: *See*—
Nagato, Shoin; Taguchi, Ryusuke; Hirai, Kenji; Hirose, Hiroaki; and Yokota, Masahiro, 5,024,692, Cl. 71-86.000.
Yokota, Senichi, to Yokota Machinery Co., Ltd. Automatic soldering method and the apparatus thereof. 5,024,370, Cl. 228-180.100.
Yokozeki, Shinichi: *See*—
Komaki, Toshihiro; Kudo, Hideo; Ishizuki, Tomonori; and Yokozeki, Shinichi, 5,025,439, Cl. 369-100.000.
Yonekawa, Takashi: *See*—
Kokubo, Kouichi; Hamada, Toshiaki; Tagawa, Shinichi; Suzumura, Nobuyasu; Buma, Shuuichi; Aburaya, Toshio; Onuma, Toshio; Sato, Kunihito; Yonekawa, Takashi; Kawanishi, Masaki; Ikemoto, Hiroyuki; and Ohashi, Kaoru, 5,024,459, Cl. 280-707.000.
Yonezawa, Yasuo; Ohnishi, Toshiya; Okumura, Shin-ichi; Sakai, Akiyoshi; Nakano, Hiroki; Matsushita, Masao; Morikawa, Atsushi; and Yoshihara, Motoshi, to Nishiyodo Air Conditioner Co., Ltd. Method of operating adsorption refrigerator. 5,024,064, Cl. 62-106.000.
York, Richard D. Sub-surface irrigation system. 5,024,555, Cl. 405-48.000.
Yoshida, Hajime, to Hajime Industries Ltd. Photo sensing device. 5,024,525, Cl. 354-126.000.
Yoshida, Kazunori: *See*—
Kawabata, Susumu; Yoshida, Kazunori; Kisanuki, Yoshikatsu; Suzuki, Hajime; and Shiraki, Masao, 5,024,253, Cl. 139-99.000.
Yoshida, Keiji; and Hamada, Mitsuo, to Toray Silicone Company, Limited. Polish containing a silicone rubber powder. 5,025,054, Cl. 524-267.000.
Yoshida, Keiji: *See*—
Funato, Ryo; Takahiro, Syuji; Yoshida, Keiji; Kubo, Shinji; and Inagaki, Motoshi, 5,024,914, Cl. 430-109.000.
Yoshida, Kiyoshi: *See*—
Etoh, Yoshiyuki; Inoue, Hiroshi; Mori, Kazuyuki; Suzuki, Koichi; Nakano, Kinichiro; Nomura, Hiroyuki; Yamamoto, Isao; and Yoshida, Kiyoshi, 5,025,379, Cl. 364-426.040.
Yoshida Kogyo K.K.: *See*—
Yamagata, Hiroshi, 5,024,721, Cl. 156-643.000.
Yoshida, Mamoru; Suya, Hachiro; Hayashi, Shoji; Koshiyama, Takao; Hashimoto, Satoshi; and Horita, Katsuhiro, to Nippon Unicar Company Limited. Flame retardant composition. 5,025,042, Cl. 523-216.000.
Yoshida, Minoru: *See*—
Tsuchida, Takefumi; Yoshida, Minoru; Kodama, Yoshimi; and Moriyama, Masahiro, 5,025,332, Cl. 360-85.000.
Yoshida, Narutaka: *See*—
Hasegawa, Hirofumi; Ohmori, Naoto; Yamada, Yukio; and Yoshida, Narutaka, 5,025,286, Cl. 355-244.000.
Yoshida, Takeshi; Nakatani, Kaname; Fukami, Toshiyuki; and Tanaka, Nariaki, to Mita Industrial Co., Ltd. Electrophotographic photosensitive material. 5,024,913, Cl. 430-67.000.
Yoshida, Toshihiko: *See*—
Yamamoto, Osamu; and Yoshida, Toshihiko, 5,025,449, Cl. 372-32.000.
Yoshiga, Norio; Kawamura, Masahiro; and Nonoyama, Hiroshi, to Mitsubishi Plastics Industries limited. Polyamide resin-metal laminate. 5,024,891, Cl. 428-414.000.
Yoshihara, Motoshi: *See*—
Yonezawa, Yasuo; Ohnishi, Toshiya; Okumura, Shin-ichi; Sakai, Akiyoshi; Nakano, Hiroki; Matsushita, Masao; Morikawa, Atsushi; and Yoshihara, Motoshi, 5,024,064, Cl. 62-106.000.
Yoshii, Takashi: *See*—
Fukui, Tetsu; Yoshii, Takashi; Takemura, Toshihiko; and Hattori, Akio, 5,024,306, Cl. 192-3.570.
Yoshikawa, Kuniyoshi: *See*—
Miyamoto, Junichi; Ohtsuka, Nobuaki; Yoshikawa, Kuniyoshi; and Mori, Seiichi, 5,025,417, Cl. 365-189.090.
Yoshikuni, Yuzo: *See*—
Sudo, Shoichi; Sakai, Yoshihisa; Yasaka, Hiroshi; Ikegami, Tetsuhiko; Yoshikuni, Yuzo; Yokohama, Itaru; and Kubodera, Kenichi, 5,025,448, Cl. 372-32.000.
Yoshimaru, Tomohisa: *See*—
Yamashita, Hiroshi; Tago, Yoshiaki; and Yoshimaru, Tomohisa, 5,025,437, Cl. 369-79.000.
Yoshimoto, Satoshi; and Funamoto, Masaya, to Brother Kogyo Kabushiki Kaisha. Multi-impact character erasing apparatus with control of correction ribbon feed. 5,024,545, Cl. 400-696.000.
Yoshinuma, Mikio: *See*—
Taya, Hiroyuki; Yoshinuma, Mikio; Yamada, Takeshi; Nishide, Kenji; Suzuki, Fumio; Fujimoto, Hirohisa; and Yamauchi, Ryozo, 5,024,501, Cl. 350-96.150.
Yoshioka, Toshio: *See*—
Kubo, Nami; Yoshioka, Toshio; Saito, Kouichi; and Tohyama, Syunroku, 5,024,767, Cl. 210-682.000.
Yoshiura, Yoshio, to Canon Kabushiki Kaisha. Facsimile apparatus connected to data communication network having time-saving capability. 5,025,497, Cl. 358-425.000.
Yoshizawa, Kenji: *See*—
Kobayashi, Toshiyuki; Koshinaka, Masao; Kinoshita, Yoshimi; Oda, Masao; and Yoshizawa, Kenji, 5,024,182, Cl. 118-723.000.
Young, William: *See*—
Walton, Richard J., 5,025,227, Cl. 331-65.000.
Youngs, Gary L.: *See*—
Parks, Carol A.; Probst, Robert E.; Rajagopal, Doraiswamy; and Youngs, Gary L., 5,025,396, Cl. 364-518.000.
Yu, Lin-Chen: *See*—
Chiu, Kuen-Wai; Yu, Lin-Chen; and Strickler, John R., 5,025,096, Cl. 544-234.000.
Yuki, Kazuya: *See*—
Sasaki, Michiaki; and Yuki, Kazuya, 5,024,583, Cl. 417-198.000.
Yum, Su Il, to Alza Corporation. Self-contained suction pump. 5,024,663, Cl. 604-131.000.
Zaidanhojin Shokuhin Sangyo Senta: *See*—
Arai, Kei; Ohashi, Minoru; Utsugi, Yoshio; Oka, Osamu; Numazawa, Kenichi; Miwa, Kenji; and Sugawara, Kenzo, 5,024,816, Cl. 422-68.100.
Zelinka, Robert F.: *See*—
Redding, John W.; and Zelinka, Robert F., 5,024,573, Cl. 414-408.000.
Zellmer, Joel A., to Hewlett-Packard Company. Microprocessor emulation system with memory mapping using variable definition and addressing of memory space. 5,025,364, Cl. 364-200.000.
Zenith Electronics Corporation: *See*—
Fendley, James R., 5,025,191, Cl. 313-407.000.
Zerbs, Stephen T.: *See*—
Bleich, Larry L.; Roberts, Joni A.; and Zerbs, Stephen T., 5,024,864, Cl. 427-424.000.
Zerox Corporation: *See*—
Nowak, William J.; Attardi, Anthony A.; and Costanza, Daniel W., 5,025,291, Cl. 355-273.000.

Zevatech AG: *See*—
Boss, Ernst; Dill, Andreas R.; and Zimmermann, Heinz, 5,024,720, Cl. 156-584.000.

Zexel Corporation: *See*—
Kurihara, Kazumasa; and Takahashi, Tsutomu, 5,024,305, Cl. 192-0.055.
Noguchi, Ichiro; and Nakata, Futoshi, 5,024,269, Cl. 165-153.000.

Zilog, Inc.: *See*—
Dalrymple, Monte J.; Verinsky, Phillip D.; and Smith, Don, 5,025,412, Cl. 364-900.000.

Zimmermann, Heinz: *See*—
Boss, Ernst; Dill, Andreas R.; and Zimmermann, Heinz, 5,024,720, Cl. 156-584.000.

Zink, Rudolf; and Phaff, Rox, to Ciba-Geigy Corporation. Pressure-or heat-sensitive recording material. 5,024,988, Cl. 503-212.000.

Zip-Pak Incorporated: *See*—
Tilman, Paul A., 5,024,537, Cl. 383-63.000.

Zivkovic, Milorad, to Daimler-Benz. Dual-circuit brake booster. 5,024,056, Cl. 60-550.000.

Zoeller, Joseph R.: *See*—
Blount, William W., Jr.; and Zoeller, Joseph R., 5,025,086, Cl. 528-272.000.

Zoueki, Georges. Ophtalmic apparatus. 5,024,516, Cl. 351-57.000.

Zuchowski, Larry; Tichenor, Clyde I.; and Ginsburgh, Irwin. Auto-stereoscopic presentation system. 5,024,521, Cl. 352-86.000.

Zupancic, Joseph J.; Swedo, Raymond J.; Jamieson, Donald R.; Schumacher, Elaine F.; and Buehler, Allyson J., to Allied-Signal Inc. Ortho-ortho aramatic bis maleimide-diamine resin. 5,025,079, Cl. 528-170.000.

Zygutis, James L.; and Doty, Gerald A., to Occupant Safety Systems, Inc. Retractor with auxiliary braking mechanism. 5,024,391, Cl. 242-107.200.

ZZ Corp.: *See*—
Hottenroth, Fred W.; and Hottenroth, Fred W., III, 5,024,208, Cl. 126-25.00R.

501 Fiat Auto S.p.A.: *See*—
Vaschetto, Lorenzo; and Fazio, Luigi, 5,024,383, Cl. 239-284.100.

501 Fujitsu Limited: *See*—
Awano, Yuji, 5,024,958, Cl. 437-31.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 18TH DAY OF JUNE, 1991

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bodnar, Ernest R. Rotary apparatus. Re. 33,613, Cl. 72-190.000.

Cole, Ronald E. Ice maker system. Re. 33,612, Cl. 62-233.000.

International Medication Systems Limited: *See*—
Ogle, George B., II, Re. 33,617, Cl. 604-192.000.

Ogle, George B., II, to International Medication Systems Limited. Protected cannula. Re. 33,617, Cl. 604-192.000.

Otis Engineering Corp.: *See*—
Schwab, Carl M., Jr.; Robison, Clark E.; and Renfroe, James B., Jr., Re. 33,614, Cl. 166-303.000.

Renfroe, James B., Jr.: *See*—
Schwab, Carl M., Jr.; Robison, Clark E.; and Renfroe, James B., Jr., Re. 33,614, Cl. 166-303.000.

Robison, Clark E.: *See*—
Schwab, Carl M., Jr.; Robison, Clark E.; and Renfroe, James B., Jr., Re. 33,614, Cl. 166-303.000.

Schwab, Carl M., Jr.; Robison, Clark E.; and Renfroe, James B., Jr., to Otis Engineering Corp. Apparatus and method for enhanced oil recovery. Re. 33,614, Cl. 166-303.000.

Uarco Incorporated: *See*—
Welsch, Bernhard J., Re. 33,616, Cl. 428-41.000.

Welsch, Bernhard J., to Uarco Incorporated. Label bearing continuous business form. Re. 33,616, Cl. 428-41.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

BASF Corporation: *See*—
Hays, Byron G.; and Stanaback, Robert J., B1 4,648,907, Cl. 106-30.000.

Hays, Byron G.; and Stanaback, Robert J., to BASF Corporation. High color strength diarylide yellow pigment compositions. B1 4,648,907, 6-18-91, Cl. 106-30.000.

Silverman, Robert R., to Twenty First Century International Fire Equipment and Services, Corporation. Fire extinguishing system for cookstove and ranges. B1 4,773,485, 6-18-91, Cl. 169-65.000.

Stanaback, Robert J.: *See*—
Hays, Byron G.; and Stanaback, Robert J., B1 4,648,907, Cl. 106-30.000.

Twenty First Century International Fire Equipment and Services, Corporation: *See*—
Silverman, Robert R., B1 4,773,485, Cl. 169-65.000.

LIST OF DESIGN PATENTEES

Abe, Takashi; Nakahara, Michihiro; and Tanaka, Kaoru, to Kabushiki Kaisha Toshiba. Television receiver. 317,604, 6-18-91, Cl. D14-133.000.

Abe, Takashi: *See*—
Ban, Kimiyoshi; and Abe, Takashi, 317,605, Cl. D14-133.000.

Abrams, Robert C.: *See*—
Weder, Donald E.; Weder, Erwin H.; Weder, Wanda M.; Craig, Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C., 317,583, Cl. D11-164.000.

Adobe Systems Incorporated: *See*—
Stone, Sumner R., 317,621, Cl. D18-24.000.

Ajco Jewelry Co. Inc.: *See*—
Eiss, Martin, 317,577, Cl. D10-30.000.

Alford, Karen R. Child protective padded hearth cover. 317,649, 6-18-91, Cl. D23-403.000.

Allen, Gaudet; and Allen, Gaudet E. Retractable roller directory. 317,630, 6-18-91, Cl. D20-42.000.

Allen, Gaudet E.: *See*—
Allen, Gaudet; and Allen, Gaudet E., 317,630, Cl. D20-42.000.

Amano, Yoshiaki: Kumagai, Kenta; Katou, Fumihito; Kasama, Kouichi; and Kiyota, Tooru, to Hitachi, Ltd. Television receiver. 317,600, 6-18-91, Cl. D14-126.000.

Andersen, Hans B.; Sorensen, Allan; and Jespersen, Per, to B & S Miljoteknik. Element of a moveable grate surface for incinerators. 317,648, 6-18-91, Cl. D23-397.000.

Aoki, Sanae; and Konoike, Tsunataka, to Tanaka Manufacturing Company Limited. Digital clock. 317,576, 6-18-91, Cl. D10-15.000.

Aoyama, Minoru: *See*—
Isomoto, Masataka; Aoyama, Minoru; and Sakurai, Mitsuru, 317,622, Cl. D18-38.000.

Aoyama, Tatsuaki: *See*—
Ito, Yasuyuki; Aoyama, Tatsuaki; and Niwa, Hisanobu, 317,644, Cl. D23-235.000.

Apps, William P., to Rehrig-Pacific Company, Inc. Nestable can tray. 317,670, 6-18-91, Cl. D34-40.000.

Aritomi, Toshiaki: *See*—
Takekoshi, Isamu; Onuma, Mitsuru; Torai, Kazuki; Hashimoto, Kazunori; and Aritomi, Toshiaki, 317,596, Cl. D14-103.000.

Avia Group International, Inc.: *See*—
Earle, John, 317,524, Cl. D2-314.000.

B & S Miljoteknik: *See*—
Andersen, Hans B.; Sorensen, Allan; and Jespersen, Per, 317,648, Cl. D23-397.000.

Back Bone Water Company: *See*—
Bermingham, Rutledge, 317,544, Cl. D7-307.000.

Bagshaw, Stanley R.: *See*—
Rea, Philip L.; and Bagshaw, Stanley R., 317,656, Cl. D25-138.000.

Bakic, Karena, to Cosmede Anstalt. Lipstick case. 317,664, 6-18-91, Cl. D28-85.000.

Ban, Kimiyoshi; and Abe, Takashi, to Kabushiki Kaisha Toshiba. Television receiver. 317,605, 6-18-91, Cl. D14-133.000.

Beecham Group p.l.c.: *See*—
Spry, Harriett M., 317,563, Cl. D9-305.000.

Beermann, Frank, to Keiper Recaro GmbH & Co. Vehicle seat or similar article. 317,533, 6-18-91, Cl. D6-356.000.

Bergstrand, John W.: *See*—
Weder, Donald E.; Weder, Erwin H.; Weder, Wanda M.; Craig, Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C., 317,583, Cl. D11-164.000.

Bermingham, Rutledge, to Back Bone Water Company. Water dispenser. 317,544, 6-18-91, Cl. D7-307.000.

Black & Decker Inc.: *See*—
McCloskey, Don R.; van Deursen, Gary; and Hattle, Sally A., 317,552, Cl. D8-36.000.

Blanco GmbH & Co. KG: *See*—
Jung, Karl-Heinz; and Muck, Manfred, 317,647, Cl. D23-290.000.

Bliss, Paul R., to Fulton Industries, Inc. Combined flashlight casing head and reflector. 317,662, 6-18-91, Cl. D26-113.000.

Bolk, Phyllis J.: *See—*
Weder, Donald E.; Weder, Erwin H.; Weder, Wanda M.; Craig, Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C., 317,583, Cl. D11-164.000.

Bolser, Chester W.; and Wierenga, Lyle H., to Pacific Floor Machine Company, Inc. Floor treating machine. 317,667, 6-18-91, Cl. D32-19.000.

Bolser, Chester W.; and Wierenga, Lyle H., to Pacific Floor Machine Company, Inc. Floor polisher machine. 317,668, 6-18-91, Cl. D32-19.000.

Bonelli, Carol, to Creative Link Limited. Contact lens case. 317,527, 6-18-91, Cl. D3-34.000.

British Telecommunications public limited company: *See—*
Dalton, Gary K., 317,612, Cl. D14-248.000.

Brown, Joe A.: *See—*
Lambert, Lloyd W.; Brown, Joe A.; and Morgan, John L., 317,545, Cl. D7-307.000.

Calderon, Julianne B. Hair ornament. 317,663, 6-18-91, Cl. D28-41.000.

Canon Kabushiki Kaisha: *See—*
Isomoto, Masataka; Aoyama, Minoru; and Sakurai, Mitsuru, 317,622, Cl. D18-38.000.
Kikuchi, Nobuo; and Sano, Hiroshi, 317,615, Cl. D16-202.000.
Yoshizawa, Tetsuo, 317,592, Cl. D13-182.000.

Carwile, Elizabeth H. Cushion for the back of a chair or the like. 317,541, 6-18-91, Cl. D6-601.000.

Casio Computer Co., Ltd.: *See—*
Yoshitake, Isamu, 317,595, Cl. D14-100.000.

Chalabian, Jack S., to K-Jack Engineering Company, Inc. Newspaper vending kiosk. 317,629, 6-18-91, Cl. D20-6.000.

Channell, Alan B., to McNeil (Ohio) Corporation. Suction inlet bowl for a submersible pump. 317,613, 6-18-91, Cl. D15-7.000.

Chembars, Guy A. Visor attachable holder for a microcassette recorder. 317,587, 6-18-91, Cl. D12-191.000.

Chen, Roger. Theodolite or similar article. 317,574, 6-18-91, Cl. D10-66.000.

Chromcraft Furniture Corp.: *See—*
Wilson, Robert L., 317,538, Cl. D6-495.000.

CKD Kabushiki Kaisha: *See—*
Ito, Yasuyuki; Aoyama, Tatsuaki; and Niwa, Hisanobu, 317,644, Cl. D23-235.000.

Continental Scale Corporation: *See—*
Joss, Michael; Gresens, Stanley; and Fraker, Richard, 317,578, Cl. D10-92.000.

Cooper Industries, Inc.: *See—*
Kusmer, Raymond J., 317,620, Cl. D18-7.000.

Cosmede Anstalt: *See—*
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Weder, Donald E.; Weder, Erwin H.; Weder, Wanda M.; Craig, Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C., 317,583, Cl. D11-164.000.

Creative Engineering Systems: *See—*
Daigle, Robert V.; and Grice, Gordon J., 317,558, Cl. D8-354.000.

Creative Link Limited: *See—*
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Daigle, Robert V.; and Grice, Gordon J., to Creative Engineering Systems. Modular conduit support. 317,558, 6-18-91, Cl. D8-354.000.

Dalton, Gary K., to British Telecommunications public limited company. Telephone handset. 317,612, 6-18-91, Cl. D14-248.000.

Danis, Sara L.: *See—*
Skaggs, Charles L.; Thomas, Charles A.; and Danis, Sara L., 317,671, Cl. D99-34.000.

Design Institute America, Inc.: *See—*
Evans, Keith, 317,531, Cl. D6-309.000.

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Eggert, Bo; and Dideriksen, Erling T., 317,635, Cl. D21-108.000.
Larsen, Kim P.; and Dideriksen, Erling T., 317,634, Cl. D21-108.000.

Diversey Corporation: *See—*
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Domation Inc.: *See—*
Marshall, Randolph L., 317,665, Cl. D30-108.000.

Donnelly, Wilma M.: *See—*
Weder, Donald E.; Weder, Erwin H.; Weder, Wanda M.; Craig, Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C., 317,583, Cl. D11-164.000.

Duke, Robert L. Combined sprayer and handle for dishwashing equipment. 317,643, 6-18-91, Cl. D23-226.000.

Dynamic Products, Inc.: *See—*
Sutherland, Jack, 317,589, Cl. D12-318.000.

Earle, John, to Avia Group International, Inc. Shoe upper. 317,524, 6-18-91, Cl. D2-314.000.

Eggert, Bo; and Dideriksen, Erling T., to Interlego A.G. Toy building element. 317,635, 6-18-91, Cl. D21-108.000.

Eiss, Martin, to Ajco Jewelry Co. Inc. Watch case. 317,577, 6-18-91, Cl. D10-30.000.

Eldon Industries, Inc.: *See—*
Evenson, Mel, 317,628, Cl. D19-92.000.

Elie, Francois, to Terraillon. Surface decoration for the bottom exterior of a cooking pan. 317,550, 6-18-91, Cl. D7-402.000.

Emmerling, Ronald, to Gemini Industries Inc. Combined stereo radio and cassette player. 317,607, 6-18-91, Cl. D14-163.000.

Emmerling, Ronald, to Gemini Industries Inc. Stereo cassette player. 317,608, 6-18-91, Cl. D14-165.000.

Etablissements Perras: *See—*
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Evans, Keith, to Design Institute America, Inc. Vanity mirror. 317,531, 6-18-91, Cl. D6-309.000.

Evenson, Mel, to Eldon Industries, Inc. Desk tray. 317,628, 6-18-91, Cl. D19-92.000.

Farmer, Michael J., to Luverne Truck Equipment Inc. Windshield ice scraper. 317,669, 6-18-91, Cl. D32-49.000.

Farris, Harold J.; Winn, J. Marvin; and Morrissey, Joseph P. Foot splint or the like. 317,651, 6-18-91, Cl. D24-192.000.

Ferrero, Pietro. Container for confectionery products. 317,564, 6-18-91, Cl. D9-318.000.

Fraker, Richard: *See—*
Joss, Michael; Gresens, Stanley; and Fraker, Richard, 317,578, Cl. D10-92.000.

Fratelli Guzzini, S.p.A.: *See—*
Gecchelin, Bruno, 317,547, Cl. D7-317.000.

Fuji Photo Film Co., Ltd.: *See—*
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Fujitsu Limited: *See—*
Irie, Toru; Fukuda, Isamu; and Takagi, Hisamitsu, 317,606, Cl. D14-138.000.

Fukuda, Isamu: *See—*
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Fulton Industries, Inc.: *See—*
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Futatsuishi, Shunichi: *See—*
Iwata, Shuji; Suyama, Tsutomu; Terazaki, Nobuo; Futatsuishi, Shunichi; Hara, Zenichiro; and Tomimatsu, Noriyuki, 317,657, Cl. D26-1.000.

Garganese, Dino L. Article display box. 317,566, 6-18-91, Cl. D9-420.000.

Gecchelin, Bruno, to Fratelli Guzzini, S.p.A. Carafe. 317,547, 6-18-91, Cl. D7-317.000.

Gemini Industries Inc.: *See—*
Emmerling, Ronald, 317,607, Cl. D14-163.000.
Emmerling, Ronald, 317,608, Cl. D14-165.000.

Gerard, Al P. Weight lifting bar. 317,641, 6-18-91, Cl. D21-197.000.

Gold Star Co., Ltd.: *See—*
Park, Jong M., 317,598, Cl. D14-126.000.

Goldsmith, Howard G., to Todd Enterprises, Inc. Adjustable boating chair pedestal. 317,539, 6-18-91, Cl. D6-495.000.

Greene, Marlin: *See—*
Guetle, Norbert J., Jr.; and Greene, Marlin, 317,652, Cl. D25-103.000.

Gresens, Stanley: *See—*
Joss, Michael; Gresens, Stanley; and Fraker, Richard, 317,578, Cl. D10-92.000.

Grice, Gordon J.: *See—*
Daigle, Robert V.; and Grice, Gordon J., 317,558, Cl. D8-354.000.

Guberman, Mary C. Mouse door knob cover. 317,555, 6-18-91, Cl. D8-322.000.

Guetle, Norbert J., Jr.; and Greene, Marlin, to Pease Industries, Inc. Decorative glass panel. 317,652, 6-18-91, Cl. D25-103.000.

Guetle, Norbert J., Jr.; and Shaffer, B. Jeremiah, to Pease Industries, Inc. Decorative glass panel. 317,653, 6-18-91, Cl. D25-103.000.

Guetle, Norbert J., Jr.; and Shaffer, B. Jeremiah, to Pease Industries, Inc. Decorative glass panel. 317,654, 6-18-91, Cl. D25-103.000.

Guetle, Norbert J., Jr.; and Shaffer, B. Jeremiah, to Pease Industries, Inc. Decorative glass panel. 317,655, 6-18-91, Cl. D25-103.000.

Hansel, Dietger, to Keiper Recaro GmbH & Co. Vehicle seat or similar article. 317,534, 6-18-91, Cl. D6-356.000.

Hara, Zenichiro: *See—*
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Harvey, Thomas J., to International Packaging Corporation. Box for jewelry items. 317,528, 6-18-91, Cl. D3-75.000.

Hashimoto, Kazunori: *See—*
Takekoshi, Isamu; Onuma, Mitsuru; Torai, Kazuki; Hashimoto, Kazunori; and Aritomi, Toshiaki, 317,596, Cl. D14-103.000.

Hashimoto, Keizo, to Midgety Engineering Co., Ltd. Car for a roller coaster. 317,642, 6-18-91, Cl. D21-247.000.

Hattle, Sally A.: *See—*
McCloskey, Don R.; van Deursen, Gary; and Hattle, Sally A., 317,552, Cl. D8-36.000.

Hau, Kenneth L. W. Combined battery operated lantern and waterproof cap. 317,659, 6-18-91, Cl. D26-38.000.

Hayashi, Hiroyuki: *See—*
Matsuoka, Ken; Uchida, Kihachiro; Horiuchi, Kazuya; and Hayashi, Hiroyuki, 317,590, Cl. D13-134.000.

Haynes, Graham J. Animal activated feeder. 317,666, 6-18-91, Cl. D30-131.000.

Henriksson, Kjell, to Linden International AB. Bag clip. 317,571, 6-18-91, Cl. D9-443.000.

Herman Miller, Inc.: *See—*
Simonton, Ronald, 317,559, Cl. D8-356.000.

Hess, Stephen C., to Winston Furniture Company of Alabama, Inc. Chair frame. 317,535, 6-18-91, Cl. D6-380.000.

Hess, Stephen C., to Winston Furniture Company of Alabama, Inc. Chair frame. 317,536, 6-18-91, Cl. D6-380.000.

Hicks, Linda M.: *See—*
Hicks, Robert H., Sr.; and Hicks, Linda M., 317,522, Cl. D1-107.000.

Hicks, Robert H., Sr.; and Hicks, Linda M. Hamburger bun or similar article. 317,522, 6-18-91, Cl. D1-107.000.
Highland Supply Corporation: *See—*
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Hirose Electric Co., Ltd.: *See—*
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Hitachi, Ltd.: *See—*
Amano, Yoshiaki; Kumagai, Kenta; Katou, Fumihito; Kasama, Kouichi; and Kiyota, Tooru, 317,600, Cl. D14-126.000.
Takekoshi, Isamu; Onuma, Mitsuru; Torai, Kazuki; Hashimoto, Kazunori; and Aritomi, Toshiaki, 317,596, Cl. D14-103.000.
Honda Giken Kogyo Kabushiki Kaisha: *See—*
Okano, Harumi, 317,658, Cl. D26-28.000.
Yoshinao, Fujimura; and Saitoh, Yusuke, 317,586, Cl. D12-184.000.
Horiuchi, Kazuya: *See—*
Matsuoka, Ken; Uchida, Kihachiro; Horiuchi, Kazuya; and Hayashi, Hiroyuki, 317,590, Cl. D13-134.000.
Hwang, Alexander H.: *See—*
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Larsen, Kim P.; and Dideriksen, Erling T., 317,634, Cl. D21-108.000.
Stephensen, Christian; and Nielsen, Jacob, 317,633, Cl. D21-108.000.
International Packaging Corporation: *See—*
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Irie, Toru; Fukuda, Isamu; and Takagi, Hisamitsu, to Fujitsu Limited. Portable telephone. 317,606, 6-18-91, Cl. D14-138.000.
Isomoto, Masataka; Aoyama, Minoru; and Sakurai, Mitsuru, to Canon Kabushiki Kaisha. Copying machine. 317,622, 6-18-91, Cl. D18-38.000.
Ito, Yasuyuki; Aoyama, Tatsuaki; and Niwa, Hisanobu, to CKD Kabushiki Kaisha. Combined pressure regulator filter and lubricator. 317,644, 6-18-91, Cl. D23-235.000.
Itoh, Kunio, to Pentel Kabushiki Kaisha. Pen cap or similar article. 317,625, 6-18-91, Cl. D19-57.000.
Iwata, Shuji; Suyama, Tsutomu; Terazaki, Nobuo; Futatsuishi, Shunichi; Hara, Zenichiro; and Tomimatsu, Noriyuki, to Mitsubisni Denki Kabushiki Kaisha. Fluorescent display tube for large screen video matrix array. 317,657, 6-18-91, Cl. D26-1.000.
Jahnke, Nicolette A. Headphone earpiece. 317,610, 6-18-91, Cl. D14-223.000.
Jespersen, Per: *See—*
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Joss, Michael; Gresens, Stanley; and Fraker, Richard, to Continental Scale Corporation. Dial scale. 317,578, 6-18-91, Cl. D10-92.000.
Jung, Karl-Heinz; and Muck, Manfred, to Blanco GmbH & Co. KG. Sink. 317,647, 6-18-91, Cl. D23-290.000.
Jurinjak, William R. Combined pen and magnetic holder therefor. 317,624, 6-18-91, Cl. D19-42.000.
K-Jack Engineering Company, Inc.: *See—*
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Kabushiki Kaisha Toshiba: *See—*
Abe, Takashi; Nakahara, Michihiro; and Tanaka, Kaoru, 317,604, Cl. D14-133.000.
Ban, Kimiyoshi; and Abe, Takashi, 317,605, Cl. D14-133.000.
Kawanabe, Masahiro, 317,597, Cl. D14-126.000.
Kawanabe, Masahiro; and Takechi, Kanta, 317,599, Cl. D14-126.000.
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Kawanabe, Masahiro, 317,603, Cl. D14-133.000.
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Kawanabe, Masahiro, to Kabushiki Kaisha Toshiba. Television receiver. 317,597, 6-18-91, Cl. D14-126.000.
Kawanabe, Masahiro; and Takechi, Kanta, to Kabushiki Kaisha Toshiba. Television receiver. 317,599, 6-18-91, Cl. D14-126.000.
Kawanabe, Masahiro, to Kabushiki Kaisha Toshiba. Television receiver. 317,601, 6-18-91, Cl. D14-133.000.
Kawanabe, Masahiro, to Kabushiki Kaisha Toshiba. Television receiver. 317,603, 6-18-91, Cl. D14-133.000.
Keiper Recaro GmbH & Co.: *See—*
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Ketoff, Sacha, to PAF S.R.L. Adjustable lamp. 317,660, 6-18-91, Cl. D26-65.000.
Kikuchi, Nobuo; and Sano, Hiroshi, to Canon Kabushiki Kaisha. Electronic still video camera. 317,615, 6-18-91, Cl. D16-202.000.
King, Donald G. Combination kniferack, cutting board and drain. 317,551, 6-18-91, Cl. D7-638.000.
Kira, Hiroshi, to Lumiere Design and Manufacturing, Inc. Outdoor bollard lighting fixture. 317,661, 6-18-91, Cl. D26-68.000.
Kiyota, Tooru: *See—*
Amano, Yoshiaki; Kumagai, Kenta; Katou, Fumihito; Kasama, Kouichi; and Kiyota, Tooru, 317,600, Cl. D14-126.000.
Koito Manufacturing Co., Ltd.: *See—*
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Kusmer, Raymond J., to Cooper Industries, Inc. Lighting calculator. 317,620, 6-18-91, Cl. D18-7.000.
Lambert, Lloyd W.; Brown, Joe A.; and Morgan, John L. Water dispenser. 317,545, 6-18-91, Cl. D7-307.000.
Lami, Daniel, to Etablissements Perras. Sprayer bottle. 317,562, 6-18-91, Cl. D9-300.000.
Lane, William A., Sr., to W. A. Lane, Inc. Packaging container. 317,567, 6-18-91, Cl. D9-425.000.
Lane, William A., Sr., to W. A. Lane, Inc. Packaging container. 317,568, 6-18-91, Cl. D9-425.000.
Lane, William A., Sr., to W. A. Lane, Inc. Packaging container. 317,569, 6-18-91, Cl. D9-425.000.
Lapadakis, Theodore P. Holder for assorted desk articles. 317,627, 6-18-91, Cl. D19-75.000.
Lapham, Ralph R., to Uvex Winter Optical, Inc. Eyeglass carrying case. 317,526, 6-18-91, Cl. D3-34.000.
Larsen, Kim P.; and Dideriksen, Erling T., to Interlego A.G. Toy building element. 317,634, 6-18-91, Cl. D21-108.000.
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Logsdon, Hartley. Container holder. 317,572, 6-18-91, Cl. D9-455.000.
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Mariol, James F., to Little Tikes Company, The. Toy rattle. 317,632, 6-18-91, Cl. D21-65.000.
Marshall, Randolph L., to Domation Inc. Dog house. 317,665, 6-18-91, Cl. D30-108.000.
Masterson, Susan M. Baseball motif picture frame. 317,530, 6-18-91, Cl. D6-303.000.
Masuzumi, Masaki, to Tomy Company, Ltd. Tool for playing in sand. 317,637, 6-18-91, Cl. D21-120.000.
Matsuoka, Ken; Uchida, Kihachiro; Horiuchi, Kazuya; and Hayashi, Hiroyuki, to Koito Manufacturing Co., Ltd. Automobile bulb socket. 317,590, 6-18-91, Cl. D13-134.000.
Matsuzaki, Shuichi, to Hirose Electric Co., Ltd. Electrical connector plug. 317,591, 6-18-91, Cl. D13-147.000.
Mayuzumi, Masaki, to Tomy Company, Ltd. Tool for playing in sand. 317,636, 6-18-91, Cl. D21-120.000.
Mayuzumi, Masaki, to Tomy Company, Ltd. Tool for playing in sand. 317,638, 6-18-91, Cl. D21-120.000.
Mayuzumi, Masaki, to Tomy Company, Ltd. Tool for playing in sand. 317,639, 6-18-91, Cl. D21-120.000.
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McCloskey, Don R.; van Deursen, Gary; and Hattle, Sally A., to Black & Decker Inc. Electrically powered can opener. 317,552, 6-18-91, Cl. D8-36.000.
McKernan, John L. Protective shield for a deadbolt assembly. 317,556, 6-18-91, Cl. D8-346.000.
McNeil (Ohio) Corporation: *See—*
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Meadows, R. Chapman. Hunting chair. 317,532, 6-18-91, Cl. D6-355.000.
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Mikami, Tatsuyuki; and Tanaka, Kaoru, to Kabushiki Kaisha Toshiba. Television receiver. 317,602, 6-18-91, Cl. D14-133.000.
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Morrissey, Joseph P.: *See—*
Farris, Harold J.; Winn, J. Marvin; and Morrissey, Joseph P., 317,651, Cl. D24-192.000.
Muck, Manfred: *See—*
Jung, Karl-Heinz; and Muck, Manfred, 317,647, Cl. D23-290.000.

Muller, Peter H., to Hwang, Alexander H. Portable electronic dictionary. 317,626, 6-18-91, Cl. D19-60.000.

Muller, Ronald L.: *See*—
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Mutti, Glenn W. Double pointed guitar pick. 317,617, 6-18-91, Cl. D17-20.000.

Nakagiri, Shigemi J. Chain shortener. 317,553, 6-18-91, Cl. D8-44.000.

Nakahara, Michihiro: *See*—
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Neuroth, Richard L.; Neuroth, Margerate A. B.; Robertson, Richard A.; and Robertson, Elizabeth A., 317,631, Cl. D21-61.000.

Neuroth, Richard L.; Neuroth, Margerate A. B.; Robertson, Richard A.; and Robertson, Elizabeth A. Bubble wand. 317,631, 6-18-91, Cl. D21-61.000.

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39 H 5,024,209
344 5,024,210
424 5,024,211

CLASS 128

4 5,024,212
69 5,024,213
75 5,024,214
5,024,215
80 C 5,024,216
82 5,024,217
200.26 5,024,218
204.21 5,024,219
207.18 5,024,220
419 PG 5,024,221
5,024,222
419 R 5,024,223
420.6 5,024,224
630 5,024,225
633 5,024,226
640 5,024,227
642 5,024,228
653 SC 5,024,229
654 5,024,230
5,024,231
5,024,232
659 5,024,233
663.01 5,024,234
732 5,024,235
735 5,024,236
760 5,024,237
771 5,024,238
774 5,024,239
780 5,024,240

CLASS 131

84.2 5,024,241
94 5,024,242

CLASS 132

116 5,024,243
270 5,024,244

CLASS 134

6 5,024,704
38 5,024,705
108 5,024,245
200 5,024,246

CLASS 136

258 5,024,706

CLASS 137

82 5,024,247
219 5,024,254
596.16 5,024,248

CLASS 138

31 5,024,250
92 5,024,251
110 5,024,249
130 5,024,252

CLASS 139

99 5,024,253

CLASS 141

11 5,024,255
329 5,024,256

CLASS 144

1 R 5,024,257

CLASS 148

253 5,024,707

CLASS 149

19.1 5,024,708

CLASS 150

140 5,024,258
159 5,024,259

CLASS 152

209 R 5,024,260
527 5,024,261

CLASS 156

69 5,024,709
89 5,024,710
153 5,024,711
184 5,024,712
221 5,024,713
243 5,024,714
245 5,024,715
345 5,024,716
354 5,024,717
475 5,024,718
522 5,024,719
584 5,024,720
628 5,024,723
643 5,024,721
5,024,722
5,024,724
5,024,725
653 5,024,726
663 5,024,727

CLASS 159

27.4 5,024,728

CLASS 160

370.2 5,024,262

CLASS 162

372 5,024,729

CLASS 164

149 5,024,161

CLASS 165

1 5,024,263
5,024,264
22 5,024,265
89 5,024,266
122 5,024,267
134.1 5,024,268
153 5,024,269

CLASS 166

63 5,024,270
66.5 5,024,271
117.7 5,024,272
289 5,024,273
303 Re.33,614
5,024,274
5,024,275
308 5,024,276
381 5,024,277

CLASS 169

65 B1 4,773,485

CLASS 171

17 5,024,278

CLASS 172

1 5,024,279
197 5,024,280
219 5,024,281

CLASS 174

52.4 5,025,114
117 F 5,025,115
250 5,025,116

CLASS 177

25.15 5,024,282

CLASS 180

89.14 5,024,283
179 5,024,284
197 5,024,285
206 5,024,286
297 5,024,287

CLASS 181

206 5,024,288
231 5,024,289
293 5,024,290

CLASS 182

85 5,024,291
90 5,024,292
93 5,024,293

CLASS 184

108 5,024,294

CLASS 187

125 5,024,295
132 5,024,296

CLASS 188

18 A 5,024,297
72.2 5,024,298
156 5,024,299
264 CC 5,024,300
284 5,024,301
299 5,024,302
300 5,024,303
356 5,024,304

CLASS 192

0.055 5,024,305
0.076 5,024,310
3.57 5,024,306
40 5,024,307
41 A 5,024,308
60 5,024,309
84 T 5,024,311

CLASS 193

37 5,024,312

CLASS 194

217 5,024,313

CLASS 196

132 5,024,730

CLASS 198

333 5,024,314
341 5,024,315
369 5,024,316
415 5,024,317
465.2 5,024,318
494 5,024,319
756 5,024,320
853 5,024,321

CLASS 200

38 R 5,025,117
49 5,025,120
148 R 5,025,118
262 5,025,119
275 5,025,121

CLASS 203

99 5,024,731

CLASS 204

1.11 5,024,732
3 5,024,733
15 5,024,734
5,024,735
49 5,024,736
71 5,024,737
105 R 5,024,738
157.15 5,024,740
157.2 5,024,739
157.22 5,024,741
157.68 5,024,742
157.69 5,024,743
194 5,024,744
198 5,024,745
297 W 5,024,746
298.09 5,024,747
298.38 5,024,748
299 R 5,024,749

CLASS 206

63.3 5,024,322
5,024,323
63.5 5,024,324
229 5,024,325
366 5,024,326
5,024,327
453 5,024,328
454 5,024,329
486 5,024,330
551 5,024,331
575 5,024,332

CLASS 208

57 5,024,750
108 5,024,751
131 5,024,752

CLASS 209

1 5,024,753
135 5,024,754
211 5,024,755
535 5,024,333
557 5,024,334
618 5,024,335

CLASS 210

93 5,024,756
136 5,024,757
198.2 5,024,758
222 5,024,759
232 5,024,760
5,024,761
321.69 5,024,762
333.01 5,024,763
484 5,024,764
651 5,024,765
668 5,024,766
682 5,024,767
712 5,024,768
721 5,024,769
747 5,024,770
791 5,024,771

CLASS 211

59.2 5,024,336
88 5,024,337
105.1 5,024,338

CLASS 215

1 C 5,024,339
5,024,340
11.1 5,024,341

CLASS 219

10.55 B 5,025,489
10.71 5,025,122
10.75 5,025,123
5,025,124
85.11 5,025,125
125.1 5,025,126
130.1 5,025,127
200 5,025,128
201 5,025,129
203 5,025,130
401 5,025,132
462 5,025,133
494 5,025,134
506 5,025,135
508 5,025,136
521 5,025,137

CLASS 220

9.3 5,024,344
326 5,024,343
366 5,024,345
401 5,024,346
468 5,024,342

CLASS 221

11 5,024,348
46 5,024,349
75 5,024,350
277 5,024,351

CLASS 222

1 5,024,347
5,024,352
94 5,024,354
162 5,024,355
185 5,024,353
312 5,024,356

CLASS 223

106 5,024,357

CLASS 224

35 5,024,358
36 5,024,359
215 5,024,360
223 5,024,361

CLASS 225

20 5,024,362
96.005 5,024,363

CLASS 227

67 5,024,365

CLASS 228

56.1 5,024,366
111 5,024,367
118 5,024,368
157 5,024,369
180.1 5,024,370
216 5,024,371
248 5,024,372

CLASS 229

68 R 5,024,373
71 5,024,374
125.39 5,024,375
160.1 5,024,376

CLASS 235

379 5,025,138
5,025,139
385 5,025,140
472 5,025,141

CLASS 236

93 B 5,024,378

CLASS 237

2 A 5,024,377
16 5,024,379

CLASS 238

218 5,024,380
367 5,024,381

CLASS 239

11 5,024,382
284.1 5,024,383
289 5,024,384
410 5,024,385

CLASS 241

3 5,024,386
21 5,024,387
301 5,024,388

CLASS 242

35.50 A 5,024,389
47 5,024,390
107.200 5,024,391
128 5,024,392
131 5,024,393
198 5,024,394

CLASS 244

3.22 5,024,395
35 R 5,024,396
118.5 5,024,398
119 5,024,399
147 5,024,400
155 A 5,024,401

CLASS 248

52 5,024,402
57 5,024,403
62 5,024,404
73 5,024,405
149 5,024,406
164 5,024,407
206.5 5,024,408
222.4 5,024,409
302 5,024,410
311.2 5,024,411
343 5,024,412
623 5,024,413
688 5,024,414
923 5,024,415

CLASS 250

201.9 5,025,142
203.3 5,025,143
207 5,025,144
211 J 5,025,145
214 L 5,025,146
216 5,025,147
227.12 5,025,148
253 5,025,150
269 5,025,151
281 5,025,152
306 5,025,153
308 5,025,154
326 5,025,155
327.2 5,025,156
5,025,157
328 5,025,158
337 5,025,159
342 5,025,149
356.1 5,025,160
364 5,025,161
385.2 5,025,162
483.1 5,025,163
5,025,164
491.1 5,025,165
492.1 5,025,166
492.2 5,025,167
548 5,025,168
574 5,025,169

CLASS 251

78 5,024,416
129.04 5,024,417
129.11 5,024,418
148 5,024,419

CLASS 252

1 5,024,772
42.7 5,024,773
47 5,024,774
52 R 5,024,775
97 5,024,776
117 5,024,777
140 5,024,778
162 5,024,779
171 5,024,780
174.13 5,024,781
174.17 5,024,782
180 5,025,069
299.01 5,024,783
5,024,784
543 5,024,785
5,024,786

CLASS 256

67 5,024,420

CLASS 260

410.6 5,024,787

CLASS 261

114.1 5,024,788

CLASS 264

6 5,024,789
16 5,024,790
21 5,024,791
22 5,024,792
29.7 5,024,793
57 5,024,794
59 5,024,795
69 5,024,796
143 5,024,797
272.15 5,024,798
284 5,024,799
502 5,024,800

CLASS 266

210 5,024,421
272 5,024,422
283 5,024,423

CLASS 267

64.27 5,024,424
140.1 5,024,425
158 5,024,426

CLASS 269

136 5,024,427
274 5,024,428

CLASS 270

30 5,024,429
53 5,024,430

CLASS 271

263 5,024,431
268 5,024,432

CLASS 272

120 5,024,433
123 5,024,434

CLASS 273

26 B 5,024,435
26 R 5,024,436
78 5,024,437
81 R 5,024,438
143 R 5,024,439
145 A 5,024,440
176 R 5,024,441
186 C 5,024,442
188 R 5,024,443
232 5,024,444
256 5,024,445
413 5,024,446
416 5,024,447
423 5,024,448

CLASS 277

35 5,024,364
37 5,024,449
5,024,450
53 5,024,451
81 R 5,024,452
106 5,024,453
207 A 5,024,454

CLASS 280

37 5,024,455
412 5,024,456
632 5,024,457
645 5,024,458
707 5,024,459
5,024,460
710 5,024,461
712 5,024,462
718 5,024,463
731 5,024,464
840 5,024,465

CLASS 285

16 5,024,466
36 5,024,467
39 5,024,468
302 5,024,469

CLASS 292

97 5,024,471
120 5,024,473
182 5,024,472
252 5,024,474
340 5,024,475

CLASS 294

16 5,024,476
68.23 5,024,397
81.2 5,024,477
88 5,024,478

CLASS 296

97.7 5,024,479
146 5,024,480
180.1 5,024,481
194 5,024,482

CLASS 297

273 5,024,483
300 5,024,484
312 5,024,485
330 5,024,486

CLASS 299

2 5,024,487

CLASS 301

108 S 5,024,488

CLASS 303

3 5,024,489
9 5,024,490
93 5,024,491
114 5,024,492

CLASS 307

116 5,025,170
150 5,025,171
261 5,025,172
265 5,025,173
272.2 5,025,174
326 5,025,175
351 5,025,176
355 5,025,177
442 5,025,178
455 5,025,179
475 5,025,180
571 5,025,181
5,025,182

CLASS 310

20 5,025,183
71 5,025,184
87 5,025,185
323 5,025,186
5,025,187

CLASS 313

273 5,025,188
407 5,025,191
414 5,025,189
479 5,025,490
619 5,025,190
623 5,025,192

CLASS 315

5.38 5,025,193
111.81 5,025,194
136 5,025,195
168 5,025,196
172 5,025,197

CLASS 318

434 5,025,198
561 5,025,199
569 5,025,200
605 5,025,201

CLASS 320

32 5,025,202

CLASS 323

268 5,025,203
274 5,025,204

CLASS 324

73.1 5,025,205
74 5,025,206
77 A 5,025,207
77 R 5,025,208
96 5,025,209
158 R 5,025,210
5,025,211
5,025,212
207.12 5,025,213
207.19 5,025,214
220 5,025,215
309 5,025,216
322 5,025,217
334 5,025,218
447 5,025,219
449 5,025,220
603 5,025,221
639 5,025,222
662 5,025,223

CLASS 328

127 5,025,224

CLASS 330

124 D 5,025,225
277 5,025,226

CLASS 331

65 5,025,227
69 5,025,228
107 A 5,025,229
116 FE 5,025,230
116 R 5,025,231

CLASS 333

26 5,025,232
128 5,025,233
166 5,025,234
204 5,025,235

CLASS 335

46 5,025,236
83 5,025,237
128 5,025,238
265 5,025,239
284 5,025,240

CLASS 336

100 5,025,241

CLASS 337

309 5,025,242

CLASS 338

18 5,025,243

CLASS 340

442 5,025,244
471 5,025,245
572 5,025,246
574 5,025,247
596 5,025,248
721 5,025,249
811 5,025,250
825.06 5,025,253
825.44 5,025,251
5,025,252
825.52 5,025,491
826 5,025,254

CLASS 341

26 5,025,255
59 5,025,256
101 5,025,257
107 5,025,258
118 5,025,259

CLASS 342

127 5,025,260
144 5,025,492
357 5,025,261
374 5,025,493

CLASS 343

705 5,025,262
715 5,025,263
767 5,025,264

CLASS 346

1.1 5,025,265
5,025,266
5,025,267
108 5,025,268
5,025,269
140 R 5,025,270
5,025,271
153.1 5,025,272
159 5,025,273

CLASS 350

1.3 5,024,493
3.6 5,024,494
3.7 5,024,495
6.8 5,024,496
96.10 5,024,498
96.11 5,024,499
96.15 5,024,500
5,024,501
96.16 5,024,502
96.18 5,024,504
96.2 5,024,497
96.20 5,024,503
96.22 5,024,505
96.23 5,024,506
96.34 5,024,507
162.13 5,024,508
254 5,024,509
321 5,024,510
356 5,024,511
514 5,024,512
518 5,024,513
618 5,024,514

CLASS 351

52 5,024,515
57 5,024,516
161 5,024,517
219 5,024,518
221 5,024,520
226 5,024,519

CLASS 352

86 5,024,521
89 5,024,522

CLASS 353

11 5,024,523
31 5,024,524

CLASS 354

21 5,025,274
106 5,025,275
126 5,024,525
152 5,025,276
173.1 5,025,277
246 5,025,278
298 5,025,279
299 5,025,280

CLASS 355

27 5,025,281
38 5,025,282
40 5,025,283
53 5,025,284
77 5,025,285
244 5,025,286
245 5,025,287
251 5,025,288
253 5,025,289
265 5,025,290
273 5,025,291
326 5,025,292

CLASS 356

73 5,024,526
124 5,024,527
356 5,024,528
376 5,024,529
402 5,024,530

CLASS 357

23.4 5,025,293
23.5 5,025,494
23.6 5,025,294
5,025,295
23.8 5,025,296
30 5,025,297
41 5,025,298
45 5,025,299
51 5,025,300
54 5,025,301
55 5,025,302
68 5,025,303
71 5,025,304
72 5,025,305
75 5,025,306
80 5,025,307

CLASS 358

10 5,025,308
12 5,025,309
19 5,025,310
31 5,025,311
36 5,025,312
54 5,025,313
93 5,025,314
140 5,025,315
5,025,495
153 5,025,496
167 5,025,316
5,025,317
213.15 5,025,318
213.29 5,025,319
229 5,025,320
296 5,025,321
298 5,025,322
300 5,025,323
335 5,025,324
425 5,025,497
447 5,025,325
498 5,025,326

CLASS 360

45 5,025,327
46 5,025,328
77.16 5,025,329
78.04 5,025,330
85 5,025,331
5,025,332
5,025,333
96.5 5,025,334
97.01 5,025,335
97.02 5,025,336
97.03 5,025,337
99.06 5,025,338
5,025,339
99.120 5,025,340
120 5,025,341
126 5,025,342
127 5,025,343

CLASS 361

88 5,025,344
119 5,025,345
156 5,025,498
283 5,025,346
386 5,025,347
398 5,025,348

CLASS 362

20 5,025,349
61 5,025,350
83 5,025,351
83.3 5,025,352
98 5,025,353
135 5,025,354
147 5,025,355
221 5,025,356
249 5,025,357
267 5,025,358
402 5,025,359

CLASS 363

16 5,025,360

CLASS 364

143 5,025,361
165 5,025,499
167.01 5,025,362
191 5,025,363
200 5,025,364
5,025,365
5,025,366
5,025,367
5,025,368
5,025,369
5,025,370
406 5,025,372
408 5,025,373
413.02 5,025,374
413.22 5,025,375
413.26 5,025,376
424.02 5,025,377
424.06 5,025,378
426.04 5,025,379
431.05 5,025,380
434 5,025,381
439 5,025,382
464.03 5,025,383
468 5,025,384
474.11 5,025,385
478 5,025,386
493 5,025,387
496 5,025,388
497 5,025,389
513 5,025,390
5,025,391
5,025,392
5,025,393
518 5,025,394
5,025,395
5,025,396
519 5,025,397
5,025,398
5,025,399
522 5,025,400
561 5,025,401
578 5,025,402
709.07 5,025,403
723 5,025,404
5,025,405
724.19 5,025,406
754 5,025,407
759 5,025,408
786 5,025,409
900 5,025,410
5,025,411
5,025,412
5,025,413
5,025,414

CLASS 365

52 5,025,415
170 5,025,416
189.09 5,025,417
200 5,025,418
221 5,025,419
230.01 5,025,420
230.05 5,025,421
233.5 5,025,422

CLASS 366

75 5,024,531

CLASS 367

96 5,025,425
127 5,025,424
137 5,025,423

CLASS 368

10 5,025,426
29 5,025,427
126 5,025,428
238 5,025,429

CLASS 369

13 5,025,430
36 5,025,431
5,025,432
44.14 5,025,433
44.36 5,025,434
48 5,025,435
77.2 5,025,436
79 5,025,437
100 5,025,439
112 5,025,438
199 5,025,440
219 5,025,371

CLASS 370

29 5,025,442
76 5,025,443
77 5,025,441
85.13 5,025,500

CLASS 371

34 5,025,444

CLASS 372

20 5,025,445
21 5,025,446
31 5,025,447
32 5,025,448
5,025,449
46 5,025,450
50 5,025,451

CLASS 374

28 5,024,532
126 5,024,533
144 5,024,534
178 5,024,535

CLASS 375

1 5,025,452
10 5,025,453
41 5,025,454
53 5,025,455
76 5,025,456
106 5,025,457
114 5,025,458
117 5,025,459
118 5,025,460
119 5,025,461

CLASS 376

217 5,024,801
258 5,024,802
270 5,024,803
285 5,024,804
305 5,024,805
352 5,024,806
5,024,807
353 5,024,808
417 5,024,809
438 5,024,810

CLASS 378

19 5,025,462
5,025,463
84 5,025,464
169 5,025,465

CLASS 379

1 5,025,466
60 5,025,467
67 5,025,468
98 5,025,469
107 5,025,470

CLASS 381

43 5,025,471
63 5,025,472
88 5,025,473
90 5,025,474

CLASS 382

1 5,025,475
2 5,025,476
8 5,025,477
22 5,025,478
38 5,025,479
50 5,025,480
53 5,025,481
56 5,025,482
58 5,025,483
61 5,025,484

CLASS 383

38 5,024,536
63 5,024,537
103 5,024,538

CLASS 384

92 5,024,539
203 5,024,540

CLASS 392

451 5,025,131

CLASS 400

88 5,024,541
124 5,024,542
5,024,543
692 5,024,544
696 5,024,545

CLASS 401

16 5,024,546
195 5,024,547

CLASS 403

78 5,024,548
404 5,024,549

CLASS 404

4 5,024,550
10 5,024,551
31 5,024,552
71 5,024,553
74 5,024,554

CLASS 405

48 5,024,555
128 5,024,556
223 5,024,557
303 5,024,560

CLASS 406

173 5,024,561

CLASS 408

1 R 5,024,562
5,024,563
115 R 5,024,564
121 5,024,565
197 5,024,566

CLASS 410

100 5,024,567

CLASS 414

142.2 5,024,568
222 5,024,570
231 5,024,571
276 5,024,572
408 5,024,573
416 5,024,574
627 5,024,575
786 5,024,576
788.4 5,024,577
790.3 5,024,569

CLASS 415

55.1 5,024,578
108 5,024,579
150 5,024,580
191 5,024,581

CLASS 416

213 R 5,024,582

CLASS 417

198 5,024,583
342 5,024,584
360 5,024,585
477 5,024,586
488 5,024,587

CLASS 418

1 5,024,588
55.3 5,024,589
61.2 5,024,590
178 5,024,591

CLASS 419

66 5,024,811

CLASS 420

49 5,024,812
402 5,024,813
473 5,024,814
487 5,024,815

CLASS 422

68.1 5,024,816
111 5,024,817
158 5,024,818
186.06 5,024,819
261 5,024,820

CLASS 423

23 5,024,821
111 5,024,822
210 5,024,823
213.5 5,024,824
309 5,024,825
335 5,024,826
610 5,024,827

CLASS 424

1.1 5,024,828
5,024,829
3 5,024,830
52 5,024,855
69 5,024,831
84 5,024,832
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DESIGN PATENTS

01 :	317,532		317,626		317,558	27 :	317,525		317,643	42 :	317,593
	317,535		317,627		317,572		317,542	39 :	317,531		317,623
	317,536		317,628		317,651		317,594		317,537	44 :	317,528
06 :	317,543		317,629	13 :	317,649	29 :	317,589		317,555		317,539
	317,553		317,646		317,665	32 :	317,580		317,613		317,566
	317,557		317,661	17 :	317,560	33 :	317,526		317,632	46 :	317,669
	317,561		317,670		317,578	34 :	317,587		317,645	47 :	317,538
	317,567	09 :	317,527		317,582		317,607		317,652	48 :	317,522
	317,568		317,541		317,583		317,608		317,653		317,540
	317,569		317,546	19 :	317,631	36 :	317,529		317,654		317,545
	317,575		317,552	20 :	317,530		317,544		317,655		317,611
	317,588		317,559	24 :	317,549		317,577		317,662	49 :	317,624
	317,610		317,617	25 :	317,556		317,640	41 :	317,524		317,663
	317,620		317,630	26 :	317,667	37 :	317,641		317,554	51 :	317,671
	317,621	12 :	317,523		317,668						

PLANT PATENTS

06 :	7,558	7,559	7,560	7,561	7,562

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